Kathleen Fuller

Access DB# 160085

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Laura Weiner Examiner #: 71724 Date: 7-2005
Art Unit: 1745 Phone Number 30? 2-1294 Serial Number: 10/656,150
Mail Box and Bldg/Room Location: 6C83 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: See front page

Inventors (please provide full names): ______

Earliest Priority Filing Date: ______

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

I Could you search for a ~~solid electrolyte having~~ the formula $Li_x Si_y M_z O_v N_w$ where $0.3 \leq x \leq 0.46$; $0.05 \leq y \leq 0.15$; $0.016 \leq z < 0.05$; $0.42 \leq v < 0.5$ and $0 \leq w \leq 0.029$ (N doesn't have to be there) where M is Nb, Ta, P or W.

II Could you search for mixing together Li_2O, SiO_2 and at least one of Nb_2O_5, Ta_2O_5, WO_3 or Li_3PO_4.

Thanks,
Laura

****

STAFF USE ONLY		Type of Search		Vendors and cost where applicable	
Searcher:	K. Fuller	NA Sequence (#)		STN	✓
Searcher Phone #:		AA Sequence (#)		Dialog	
Searcher Location:		Structure (#)	1	Questel/Orbit	
Date Searcher Picked Up:		Bibliographic		Dr.Link	
Date Completed:	8/17/05	Litigation		Lexis/Nexis	
Searcher Prep & Review Time:	40	Fulltext	1	Sequence Systems	
Clerical Prep Time:		Patent Family		WWW/Internet	
Online Time:	25	Other		Other (specify)	

PTO-1590 (8-01)

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*                                                                 *
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http://www.cas.org/ONLINE/DBSS/registryss.html

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FILE LAST UPDATED: 16 Aug 2005  (20050816/ED)

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 This file contains CAS Registry Numbers for easy and accurate
 substance identification.
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=> d que l21
L3          757 SEA FILE=REGISTRY ABB=ON  (LI(L)SI(L)(NB OR TA  OR P OR
                W)(L)O)/ELS
L8          143 SEA FILE=REGISTRY ABB=ON  L3(L)4-5/ELC.SUB
L9          146 SEA FILE=HCAPLUS ABB=ON  L8
L12          17 SEA FILE=REGISTRY ABB=ON  L9 AND 1-10/N
L13         125 SEA FILE=REGISTRY ABB=ON  L9 NOT 1-5/S
L14          88 SEA FILE=REGISTRY ABB=ON  L13 NOT 1/TI,AL,FE
L15         102 SEA FILE=HCAPLUS ABB=ON  L14
L16           4 SEA FILE=HCAPLUS ABB=ON  L12
L17         102 SEA FILE=HCAPLUS ABB=ON  (L15 OR L16)
L18          25 SEA FILE=HCAPLUS ABB=ON  L17(L)ELECTROLYT?
L19          29 SEA FILE=HCAPLUS ABB=ON  L17 AND BATTER?
L20          29 SEA FILE=HCAPLUS ABB=ON  L19 AND BATTER?
L21          33 SEA FILE=HCAPLUS ABB=ON  L18 OR L20


=> d l21 1-33 bib abs ind hitstr
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L21 ANSWER 1 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:16061 HCAPLUS
DN 142:97543
TI Solid electrolyte and all-solid **battery**
IN Ugaji, Masaya; Mino, Shinji; Shibano, Yasuyuki; Ito, Shuji
PA Matsushita Electric Industrial Co., Ltd., Japan
SO PCT Int. Appl., 33 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

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       PATENT NO.          KIND    DATE          APPLICATION NO.        DATE
       ---------------     ----    --------      --------------------   --------
PI     WO 2005001983        A1     20050106      WO 2004-JP9302         20040624
           W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
               CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
               GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK,
               LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO,
               NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,
               TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
          RW:  BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,
               AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,
               EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,
               SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
               SN, TD, TG
       JP 2005038843        A2     20050210      JP 2004-186806         20040624
       JP 3677508           B2     20050803
PRAI   JP 2003-184625       A      20030627
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AB The title solid electrolyte can be represented by the following general formula: LiaPbMcOdNe (wherein M represents at least one element selected from the group consisting of Si, B, Ge, Al, C, Ga and S; and a, b, c, d and e resp. satisfy a = 0.62-4.98, b = 0.01-0.99, c = 0.01-0.99, d = 1.070-3.985, e = 0.01-0.50, and b + c = 1.0). This solid electrolyte is used for preparation of all solid **battery** and is characterized by having high resistance to humidity.
IC ICM H01M010-36
ICS H01B001-06; H01M006-18
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
ST solid electrolyte **battery** resistance humidity

IT Primary **batteries**
Solid electrolytes
(solid electrolyte for preparation of all-solid **battery**)
IT 7440-06-4, Platinum, uses **816416-33-8 816416-33-8**
816416-35-0 816416-37-2 816416-39-4 816416-41-8
816416-41-8 816416-43-0 816416-43-0 816416-45-2, Aluminum lithium
nitride oxide phosphate (Al0.2Li3.2N0.3O0.25(PO4)0.8) 816416-47-4
816416-49-6 816416-51-0 **816416-53-2 816416-55-4**
816416-57-6 816416-61-2 816416-63-4, Lithium
nitride oxide phosphate silicate (Li3.4N0.3O0.05(PO4)0.4(SiO3)0.6)
816416-65-6, Lithium nitride oxide phosphate silicate
(Li3.7N0.3O0.35(PO4)0.1(SiO3)0.9) **816416-67-8**, Lithium nitride
oxide phosphate silicate (Li3.79N0.3O0.44(PO4)0.01(SiO3)0.99)
816416-69-0 816416-71-4 816416-75-8 816416-77-0 816416-79-2
816416-81-6, Lithium nitride oxide phosphate silicate
(Li3N0.01O0.08(PO4)0.8(SiO3)0.2) **816416-82-7 816416-85-0**
816416-87-2 816416-88-3 816416-89-4
RL: TEM (Technical or engineered material use); USES (Uses)
(solid **electrolyte** for preparation of all-solid **battery**)
IT 554-13-2 10102-24-6, Lithium metasilicate Li2SiO3 12003-67-7, Aluminum
lithium oxide AlLiO2 12025-11-5, Germanium lithium oxide (GeLi4O4)
12315-28-5, Germanium lithium oxide (GeLi2O3) 12355-58-7, Aluminum
lithium oxide AlLi5O4 13453-69-5, Lithium borate LiBO2 13453-84-4,
Lithium silicate Li4SiO4
RL: TEM (Technical or engineered material use); USES (Uses)
(target material containing; solid electrolyte for preparation of all-solid
battery)
IT **816416-33-8 816416-35-0 816416-53-2**
816416-55-4 816416-57-6 816416-61-2
816416-63-4, Lithium nitride oxide phosphate silicate
(Li3.4N0.3O0.05(PO4)0.4(SiO3)0.6) **816416-65-6**, Lithium nitride
oxide phosphate silicate (Li3.7N0.3O0.35(PO4)0.1(SiO3)0.9)
816416-67-8, Lithium nitride oxide phosphate silicate
(Li3.79N0.3O0.44(PO4)0.01(SiO3)0.99) **816416-81-6**, Lithium
nitride oxide phosphate silicate (Li3N0.01O0.08(PO4)0.8(SiO3)0.2)
816416-82-7 816416-85-0
RL: TEM (Technical or engineered material use); USES (Uses)
(solid **electrolyte** for preparation of all-solid **battery**)
RN 816416-33-8 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li3(PO3)0.8N0.3O0.25(SiO4)0.
2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.25	17778-80-2
O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	3	7439-93-2

RN 816416-35-0 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li2.6(PO3)0.8N0.3O0.05(SiO4)
0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.05	17778-80-2

O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	2.6	7439-93-2

RN 816416-53-2 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li2.81(PO3)0.99N0.3O0.44(SiO4)0.01) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.44	17778-80-2
O4Si	0.01	17181-37-2
O3P	0.99	15389-19-2
Li	2.81	7439-93-2

RN 816416-55-4 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li2.85(PO3)0.95N0.3O0.4(SiO4)0.05) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.4	17778-80-2
O4Si	0.05	17181-37-2
O3P	0.95	15389-19-2
Li	2.85	7439-93-2

RN 816416-57-6 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li2.9(PO3)0.9N0.3O0.35(SiO4)0.1) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.35	17778-80-2
O4Si	0.1	17181-37-2
O3P	0.9	15389-19-2
Li	2.9	7439-93-2

RN 816416-61-2 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li3.3(PO3)0.5N0.3O0.45(SiO3)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.45	17778-80-2
O3Si	0.5	15593-90-5
O3P	0.5	15389-19-2
Li	3.3	7439-93-2

RN 816416-63-4 HCAPLUS
CN Lithium nitride oxide phosphate silicate (Li3.4N0.3O0.05(PO4)0.4(SiO3)0.6) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.05	17778-80-2
O3Si	0.6	15593-90-5
O4P	0.4	14265-44-2
Li	3.4	7439-93-2

RN 816416-65-6 HCAPLUS
CN Lithium nitride oxide phosphate silicate (Li3.7N0.3O0.35(PO4)0.1(SiO3)0.9) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.35	17778-80-2
O3Si	0.9	15593-90-5
O4P	0.1	14265-44-2
Li	3.7	7439-93-2

RN 816416-67-8 HCAPLUS
CN Lithium nitride oxide phosphate silicate (Li3.79N0.3O0.44(PO4)0.01(SiO3)0.99) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.3	17778-88-0
O	0.44	17778-80-2
O3Si	0.99	15593-90-5
O4P	0.01	14265-44-2
Li	3.79	7439-93-2

RN 816416-81-6 HCAPLUS
CN Lithium nitride oxide phosphate silicate (Li3N0.01O0.08(PO4)0.8(SiO3)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.01	17778-88-0
O	0.08	17778-80-2
O3Si	0.2	15593-90-5
O4P	0.8	14265-44-2
Li	3	7439-93-2

RN 816416-82-7 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li3(PO3)0.8N0.1O0.55(SiO4)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.1	17778-88-0
O	0.55	17778-80-2
O4Si	0.2	17181-37-2
O3P	0.8	15389-19-2
Li	3	7439-93-2

RN 816416-85-0 HCAPLUS
CN Lithium metaphosphate nitride oxide silicate (Li3(PO3)0.8N0.5O0.15(SiO3)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	0.5	17778-88-0
O	0.15	17778-80-2
O3Si	0.2	15593-90-5
O3P	0.8	15389-19-2
Li	3	7439-93-2

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 2 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:1042410 HCAPLUS
DN 142:264251
TI Crystalline Li3PO4/Li4SiO4 solid solutions as an electrolyte for film **batteries** using sputtered cathode layers
AU Whitacre, J. F.; West, W. C.
CS Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91109, USA
SO Solid State Ionics (2004), 175(1-4), 251-255
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier B.V.
DT Journal
LA English
AB Crystalline solid solns. of 1:1 Li3PO4:Li4SiO4 were synthesized and tested electrochem. with phys. vapor deposited thin-film electrodes. After cathode deposition, the electrolyte/cathode structures were annealed at 700° for 2 h - a process that resulted in cathode crystallization without encouraging deleterious interfacial reactions. The electrolyte functioned well in this configuration. Test cells were taken through multiple charge/discharge cycles at different rates and temps. and had enhanced performance parameters. Probably this material functions well in Li **batteries** fabricated by using proper form factors.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST cryst lithium phosphate silicate solid soln electrolyte lithium **battery**
IT Solid solutions
(binary; crystalline Li3PO4/Li4SiO4 solid solution as electrolyte for thin-film lithium **batteries** with sputtered cathode layers)
IT **Battery** electrolytes
(crystalline Li3PO4/Li4SiO4 solid solution as electrolyte for thin-film lithium **batteries** with sputtered cathode layers)
IT Secondary **batteries**
(lithium; crystalline Li3PO4/Li4SiO4 solid solution as electrolyte for thin-film lithium **batteries** with sputtered cathode layers)
IT 12190-79-3, Cobalt lithium oxide (CoLiO2)
RL: DEV (Device component use); USES (Uses)
(cathode; crystalline Li3PO4/Li4SiO4 solid solution as electrolyte for thin-film lithium **batteries** with sputtered cathode layers)
IT **138728-82-2**, Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5)
RL: DEV (Device component use); USES (Uses)
(crystalline Li3PO4/Li4SiO4 solid solution as **electrolyte** for thin-film lithium **batteries** with sputtered cathode layers)
IT **138728-82-2**, Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5)

RL: DEV (Device component use); USES (Uses)
(crystalline Li3PO4/Li4SiO4 solid solution as **electrolyte** for thin-film lithium **batteries** with sputtered cathode layers)
RN 138728-82-2 HCAPLUS
CN Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	0.5	14265-44-2
Li	3.5	7439-93-2

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 3 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:632469 HCAPLUS
DN 141:176832
TI Nonaqueous electrolyte lithium ion secondary **battery** containing lithium-based composite metal oxide for improved discharge capacity and thermal stability
IN Kubo, Koichi
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004220801	A2	20040805	JP 2003-3291	20030109
PRAI	JP 2003-3291		20030109		

AB Disclosed is the nonaq. electrolyte lithium ion secondary **battery** comprising (a) a pos. electrode containing a metal oxide Li2-xM1-yM'yXzAO4 (M = Ti, Nb, etc.; M' = V, Cr, Mn, etc.; X = O, F; A = Si, Ge, P, S; $0 \leq x \leq 2$; $0 \leq y \leq 0.5$; and $0.5 \leq z \leq 1.5$) having the tetragonal crystal structure, (b) a neg. electrode, and (c) a nonaq. electrolyte.
IC ICM H01M004-58
ICS H01M004-02; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST nonaq electrolyte lithium ion secondary **battery**; metal oxide composite lithium
IT Secondary **batteries**
(lithium; pos. electrode of nonaq. electrolyte lithium ion secondary **battery**)
IT **Battery** electrodes
(pos. electrode of nonaq. electrolyte lithium ion secondary **battery**)
IT 530740-14-8, Molybdenum oxide phosphate (Mo2O3(PO4)2) 732298-51-0, Lithium molybdenum oxide phosphate (Li2MoO(PO4)) 732298-52-1, Lithium niobium oxide phosphate (Li2NbO(PO4)) 732298-53-2, Lithium tantalum oxide phosphate (Li2TaO(PO4)) 732298-54-3, Lithium tungsten oxide phosphate (Li2WO(PO4)) 732298-55-4, Iron lithium molybdenum oxide phosphate (Fe0.33Li2Mo0.67O(PO4)) 732298-56-5, Germanium lithium molybdenum oxide (GeLi2MoO5) 732298-58-7 732298-59-8, Iron lithium tantalum fluoride phosphate (Fe0.5Li2Ta0.5F(PO4)) 732298-60-1 732298-61-2 732298-62-3 732298-63-4, Lithium titanium oxide sulfate (Li2TiO(SO4)) 732298-64-5, Lithium titanium vanadium oxide sulfate

(Li2Ti0.5V0.5O(SO4)) 732298-65-6, Lithium niobium vanadium oxide sulfate
(Li2Nb0.5V0.5O(SO4)) 732298-66-7, Lithium molybdenum oxide phosphate
(Li2MoO1.5(PO4)) 732298-67-8, Lithium titanium oxide phosphate
(Li2TiO0.5(PO4)) **732298-68-9**, Lithium tungsten oxide silicate
(Li2WO(SiO4))
RL: DEV (Device component use); USES (Uses)
(pos. electrode of nonaq. **electrolyte** lithium ion secondary
battery)

IT **732298-68-9**, Lithium tungsten oxide silicate (Li2WO(SiO4))
RL: DEV (Device component use); USES (Uses)
(pos. electrode of nonaq. **electrolyte** lithium ion secondary
battery)

RN 732298-68-9 HCAPLUS
CN Lithium tungsten oxide silicate (Li2WO(SiO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1	17778-80-2
O4Si	1	17181-37-2
W	1	7440-33-7
Li	2	7439-93-2

L21 ANSWER 4 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:493210 HCAPLUS
DN 141:26184
TI Membrane-electrode laminate and fuel cell
IN Kato, Masahiro; Gonohe, Yasuhiro
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004171997	A2	20040617	JP 2002-338041	20021121
PRAI	JP 2002-338041		20021121		

AB The laminate has a solid electrolyte membrane between a cathode and an anode; where the membrane contains ≥1 silicate salt selected from LixSi1-yTyOz (T = Ti, Zr, Hf, Ge, Sn and/or P; x = 3.2-4.8; y = 0-1.3; z = 3.2-4.8), Li2-aAlaSi1-yTyOz (T = Ti, Zr, Hf, Ge, Sn and/or P; a = 0.8-1.2; y = 0-1.3; z = 3.2-4.8), K2-bAlbSi1-yTyOz (T = Ti, Zr, Hf, Ge, Sn and/or P; b = 0.8-1.2; y = 0-1.3; z = 3.2-4.8), and Cs2-dAldSi1-yTyOz (T = Ti, Zr, Hf, Ge, Sn and/or P; d = 0.8-1.2; y = 0-1.3; z = 3.2-4.8). The fuel cell has the above laminate and a pair of separators having an oxidant gas passage and/or a fuel passage.

IC ICM H01M008-02
ICS C04B035-16; H01M008-12
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell structure electrolyte membrane silicate salt
IT Fuel cell electrolytes
Fuel cells
(membrane-electrode laminates containing silicate salts in electrolyte membranes for fuel cells)

IT 7440-02-0, Nickel, uses 12003-48-4, Aluminum cesium silicate (AlCsSiO4) 12003-49-5, Aluminum potassium silicate (AlKSiO4) 13453-84-4, Lithium silicon oxide (Li4SiO4) 19497-94-0, Aluminum lithium silicon oxide (AlLiSiO4) 223506-76-1, Lanthanum manganese strontium oxide

(La0.87MnSr0.1O3) 700866-82-6, Lithium titanium oxide silicate (Li4Ti0.3O1.2(SiO4)0.7) 700866-83-7, Lithium zirconium oxide silicate (Li4Zr0.3O1.2(SiO4)0.7) 700866-85-9, Hafnium lithium oxide silicate (Hf0.3Li4O1.2(SiO4)0.7) 700866-87-1, Germanium lithium oxide silicate (Ge0.3Li4O1.2(SiO4)0.7) 700866-89-3, Lithium tin oxide silicate (Li4Sn0.3O1.2(SiO4)0.7) **700866-90-6**, Lithium phosphate silicate (Li4(PO4)0.3(SiO4)0.7) 700866-91-7, Aluminum lithium titanium oxide silicate (AlLiTi0.3O1.2(SiO4)0.7) 700866-92-8 700866-94-0, Aluminum hafnium lithium oxide silicate (AlHf0.3LiO1.2(SiO4)0.7) 700866-95-1 700866-97-3, Aluminum lithium tin oxide silicate (AlLiSn0.3O1.2(SiO4)0.7) 700866-98-4, Aluminum lithium phosphate silicate (AlLi(PO4)0.3(SiO4)0.7) 700866-99-5 700867-01-2 700867-02-3 700867-04-5 700867-07-8, Aluminum potassium tin oxide silicate (AlKSn0.3O1.2(SiO4)0.7) 700867-10-3, Aluminum potassium phosphate silicate (AlK(PO4)0.3(SiO4)0.7) 700867-13-6, Aluminum cesium titanium oxide silicate (AlCsTi0.3O1.2(SiO4)0.7) 700867-16-9, Aluminum cesium zirconium oxide silicate (AlCsZr0.3O1.2(SiO4)0.7) 700867-19-2, Aluminum cesium hafnium oxide silicate (AlCsHf0.3O1.2(SiO4)0.7) 700867-21-6, Aluminum cesium germanium oxide silicate (AlCsGe0.3O1.2(SiO4)0.7) 700867-24-9, Aluminum cesium tin oxide silicate (AlCsSn0.3O1.2(SiO4)0.7) 700867-27-2, Aluminum cesium phosphate silicate (AlCs(PO4)0.3(SiO4)0.7)
RL: DEV (Device component use); USES (Uses)
(membrane-electrode laminates containing silicate salts in **electrolyte** membranes for fuel cells)

IT **700866-90-6**, Lithium phosphate silicate (Li4(PO4)0.3(SiO4)0.7)
RL: DEV (Device component use); USES (Uses)
(membrane-electrode laminates containing silicate salts in **electrolyte** membranes for fuel cells)

RN 700866-90-6 HCAPLUS

CN Lithium phosphate silicate (Li4(PO4)0.3(SiO4)0.7) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.7	17181-37-2
O4P	0.3	14265-44-2
Li	4	7439-93-2

L21 ANSWER 5 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:430509 HCAPLUS

DN 140:426100

TI Solid electrolyte for **battery**

IN Park, Young-sin; Lee, Seok-soo; Jin, Young-gu

applicant

PA Samsung Electronics Co., Ltd., S. Korea

SO U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004101761	A1	20040527	US 2003-656180	20030908
	EP 1427042	A1	20040609	EP 2003-255187	20030821
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	JP 2004179161	A2	20040624	JP 2003-387552	20031118
PRAI	KR 2002-74362	A	20021127		

AB A solid electrolyte, a method of manufacturing the same, and a lithium **battery** and a thin-film **battery** that employ the solid

electrolyte are provided. The solid electrolyte contains nitrogen to enhance the ionic conductivity and electrochem. stability of **batteries.**

IC ICM H01M006-18
ICS C04B035-00
INCL 429322000; 501096100; 501096500
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** solid electrolyte
IT Vapor deposition process
(chemical; solid electrolyte for **battery**)
IT Electron beams
(deposition by; solid electrolyte for **battery**)
IT Ion beams
(deposition ny; solid electrolyte for **battery**)
IT Secondary **batteries**
(lithium; solid electrolyte for **battery**)
IT **Battery** electrolytes
Sputtering
(solid electrolyte for **battery**)
IT 1313-96-8, Niobium oxide (Nb2O5) 1314-35-8, Tungsten oxide (WO3), processes 1314-61-0, Tantalum oxide (Ta2O5) 7631-86-9, Silica, processes 10377-52-3 12057-24-8, Lithium oxide (Li2O), processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(solid electrolyte for **battery**)
IT **691009-59-3P**, Lithium niobium oxide silicate (Li0.32Nb0.32O0.29(SiO3)0.67) **691009-60-6P**, Lithium niobium oxide silicate (Li1.16Nb0.58O1.77(SiO4)0.13) **691009-62-8P**, Lithium niobium oxide silicate (Li1.16Nb0.26O0.65(SiO4)0.29) **691009-64-0P**, Lithium niobium oxide silicate (Li1.34Nb0.32O1.15(SiO4)0.16) **691009-66-2P**, Lithium niobium oxide silicate (Li1.3Nb0.1O0.3(SiO4)0.3) **691009-68-4P**, Lithium niobium oxide silicate (Li1.4Nb0.2O0.8(SiO4)0.2) **691009-70-8P**, Lithium niobium oxide silicate (Li1.4Nb0.1O0.45(SiO4)0.25) **691009-72-0P**, Lithium oxide phosphate silicate (Li1.55O0.2(PO4)0.05(SiO4)0.25)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(solid **electrolyte** for **battery**)
IT 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(solid electrolyte for **battery**)
IT **691009-59-3P**, Lithium niobium oxide silicate (Li0.32Nb0.32O0.29(SiO3)0.67) **691009-60-6P**, Lithium niobium oxide silicate (Li1.16Nb0.58O1.77(SiO4)0.13) **691009-62-8P**, Lithium niobium oxide silicate (Li1.16Nb0.26O0.65(SiO4)0.29) **691009-64-0P**, Lithium niobium oxide silicate (Li1.34Nb0.32O1.15(SiO4)0.16) **691009-66-2P**, Lithium niobium oxide silicate (Li1.3Nb0.1O0.3(SiO4)0.3) **691009-68-4P**, Lithium niobium oxide silicate (Li1.4Nb0.2O0.8(SiO4)0.2) **691009-70-8P**, Lithium niobium oxide silicate (Li1.4Nb0.1O0.45(SiO4)0.25) **691009-72-0P**, Lithium oxide phosphate silicate (Li1.55O0.2(PO4)0.05(SiO4)0.25)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(solid **electrolyte** for **battery**)
RN 691009-59-3 HCAPLUS
CN Lithium niobium oxide silicate (Li0.32Nb0.32O0.29(SiO3)0.67) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.29	17778-80-2
O3Si	0.67	15593-90-5
Nb	0.32	7440-03-1
Li	0.32	7439-93-2

RN 691009-60-6 HCAPLUS
CN Lithium niobium oxide silicate (Li1.16Nb0.58O1.77(SiO4)0.13) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.77	17778-80-2
O4Si	0.13	17181-37-2
Nb	0.58	7440-03-1
Li	1.16	7439-93-2

RN 691009-62-8 HCAPLUS
CN Lithium niobium oxide silicate (Li1.16Nb0.26O0.65(SiO4)0.29) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.65	17778-80-2
O4Si	0.29	17181-37-2
Nb	0.26	7440-03-1
Li	1.16	7439-93-2

RN 691009-64-0 HCAPLUS
CN Lithium niobium oxide silicate (Li1.34Nb0.32O1.15(SiO4)0.16) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.15	17778-80-2
O4Si	0.16	17181-37-2
Nb	0.32	7440-03-1
Li	1.34	7439-93-2

RN 691009-66-2 HCAPLUS
CN Lithium niobium oxide silicate (Li1.3Nb0.1O0.3(SiO4)0.3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.3	17778-80-2
O4Si	0.3	17181-37-2
Nb	0.1	7440-03-1
Li	1.3	7439-93-2

RN 691009-68-4 HCAPLUS
CN Lithium niobium oxide silicate (Li1.4Nb0.2O0.8(SiO4)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.8	17778-80-2
O4Si	0.2	17181-37-2
Nb	0.2	7440-03-1
Li	1.4	7439-93-2

RN 691009-70-8 HCAPLUS
CN Lithium niobium oxide silicate (Li1.4Nb0.1O0.45(SiO4)0.25) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.45	17778-80-2
O4Si	0.25	17181-37-2
Nb	0.1	7440-03-1
Li	1.4	7439-93-2

RN 691009-72-0 HCAPLUS
CN Lithium oxide phosphate silicate (Li1.55O0.2(PO4)0.05(SiO4)0.25) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.2	17778-80-2
O4Si	0.25	17181-37-2
O4P	0.05	14265-44-2
Li	1.55	7439-93-2

L21 ANSWER 6 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:180560 HCAPLUS
DN 140:238416
TI Total solid state **battery** and evaluation method
IN Mino, Shinji; Ishii, Hironori
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004071303	A2	20040304	JP 2002-227807	20020805
PRAI	JP 2002-227807		20020805		

AB The **battery** is made by laminating on a substrate in that order: a first electrode layer, a solid electrolyte layer, and a second electrode layer. An electron collection layer is formed which contacts with at least one of the electrode layer. A test chip is form on the same substrate at a different location to the solid state **battery** with a pair of conducting terminals on the 2 ends or on the top and bottom of the test chip. The **battery** is evaluated by measuring the characteristic data of the **battery** and the **battery** test chip.
IC ICM H01M010-36
ICS H01M002-22; H01M010-48
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 76
ST total solid state **battery** evaluation
IT Vapor deposition process
(chemical; total solid state **battery** and evaluation method using test chip)
IT Primary **batteries**
(total solid state **battery** and evaluation method using test chip)
IT 7440-43-9, Cadmium, uses 11126-15-1, Lithium vanadium oxide 12023-04-0 12053-95-1 12054-48-7, Nickel hydroxide (Ni(OH)2) 12057-65-7 12067-91-3 12186-89-9 12190-79-3, Cobalt lithium oxide CoLiO2 12196-72-4 12213-73-9 12680-08-9, Lithium titanium sulfide 22205-45-4, Copper sulfide Cu2S 37296-91-6, Lithium molybdenum oxide 37367-96-7, Lithium molybdenum sulfide 39300-70-4, Lithium nickel oxide 39457-42-6, Lithium manganese oxide 66118-28-3 68939-05-9, Copper titanium sulfide 70537-07-4, Silver titanium sulfide 111346-27-1, Copper molybdenum sulfide Cu2Mo6S7.8 126044-10-8, Silver vanadium oxide Ag0.7V2O5 667421-48-9
RL: DEV (Device component use); USES (Uses)
(electrode active material containing; total solid state **battery** and evaluation method using test chip)
IT 1303-86-2, Boron oxide, uses 1310-65-2, Lithium hydroxide (Li(OH)) 1313-27-5, Molybdenum oxide MoO3, uses 1314-56-3, Phosphorus oxide (P2O5), uses 1314-62-1, Vanadium oxide (V2O5), uses 1314-80-3, Phosphorus sulfide (P2S5) 1317-39-1, Copper oxide (Cu2O), uses 7681-65-4, Copper iodide (CuI) 7783-96-2, Silver iodide AgI 10377-51-2, Lithium iodide (LiI) 10377-52-3 12007-33-9, Boron sulfide B2S3 12031-48-0, Lanthanum zirconium oxide La2Zr2O7 12057-24-8, Lithium oxide (Li2O), uses 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide SiS2 26134-62-3, Lithium nitride (Li3N) 39390-08-4, Silver iodide tungstate Ag6I4WO4 73379-32-5, Copper rubidium chloride iodide (Cu8Rb2Cl7I3) **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3) 667421-46-7 667421-47-8, Cerium lanthanum magnesium oxide (Ce0.5LaMg0.5O3)
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte** containing; total solid state **battery** and evaluation method using test chip)
IT 1303-00-0, Gallium arsenide, uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-98-7, Molybdenum, uses 7440-33-7, Tungsten, uses 7631-86-9, Silica, uses 12033-89-5, Silicon nitride, uses 12039-70-2, Titanium silicide TiSi 12166-56-2, Tungsten silicide WSi 12597-84-1, Aluminum copper silicide AlCuSi 14808-60-7, Quartz, uses 37254-60-7 470465-38-4, Titanium silicide TiSi
RL: DEV (Device component use); USES (Uses)
(total solid state **battery** and evaluation method using test chip)
IT **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte** containing; total solid state **battery** and evaluation method using test chip)
RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

L21 ANSWER 7 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:143909 HCAPLUS
DN 140:425989
TI Syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**
AU Chen, Ya-guang; Wang, Cun-guo; Zhang, Xi-yan; Xie, De-min; Wang, Rong-shun
CS Faculty of Chemistry, Northeast Normal University, Changchun, 130024, Peop. Rep. China
SO Chemical Research in Chinese Universities (2004), 20(1), 77-80
CODEN: CRCUED; ISSN: 1005-9040
PB Higher Education Press
DT Journal
LA English
AB The all-lithium salts of heteropoly acid LixXM12O40 (HPA-Li) (X=P, Si; M=Mo, W) were obtained via ion exchange and characterized by means of IR and UV spectroscopies, TG and elemental analyses. The conductivity of the electrolytic solution consisting of Li3PW12O40 and PC/DME mixing solvent (1/2.5, volume ration) is up to 7.2+10-2 S/cm, being higher than that of LiClO4 as the electrolyte. The all-lithium salts were used as electrolytes in secondary lithium-ion **batteries.** The discharge capacity of the PAS/Li **batteries** with Li3PW12O40 electrolyte solns. reaches to 148 (mA · h)/g and the cyclic life is up to 380 times; much better than those of commercialized products with LiClO4 and LiAsF6 as electrolytes.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 73, 76, 78
ST lithium salt heteropolyacid electrolyte secondary **battery**
IT Heteropoly acids
RL: NUU (Other use, unclassified); USES (Uses)
(lithium salts; syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)
IT Secondary **batteries**
(lithium; syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)
IT IR spectra
UV and visible spectra
(of all-lithium salts of heteropolyacid)
IT Electric conductivity
(of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)
IT Electric capacitance
(of lithium-ion **battery** with of all-lithium salts of heteropolyacid as electrolyte with PC/DME)
IT Electrolytes
(syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)
IT Ion exchange
(syntheses of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**, by)
IT Heteropoly acids
RL: NUU (Other use, unclassified); USES (Uses)
(tungstophosphoric, lithium salts; syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)
IT Heteropoly acids
RL: NUU (Other use, unclassified); USES (Uses)
(tungstosilicic, lithium salts; syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)

IT 692729-67-2P
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)
(all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**, by)

IT 108-32-7, Propylene carbonate 110-71-4
RL: NUU (Other use, unclassified); USES (Uses)
(elec. capacitance of lithium-ion **battery** with of all-lithium salts of heteropolyacid as electrolyte with PC/DME)

IT 11104-88-4, Molybdophosphoric acid 11104-89-5, Molybdosilicic acid
RL: NUU (Other use, unclassified); USES (Uses)
(lithium salts; syntheses and application of all-lithium salts of heteropolyacid as electrolyte of lithium-ion **battery**)

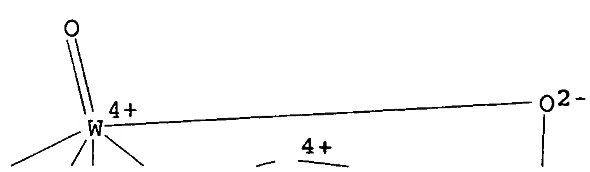
IT **692729-69-4P** 692729-71-8P 692729-72-9P
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)
(of all-lithium salts of heteropolyacid as **electrolyte** of lithium-ion **battery**)

IT **692729-69-4P**
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)
(of all-lithium salts of heteropolyacid as **electrolyte** of lithium-ion **battery**)

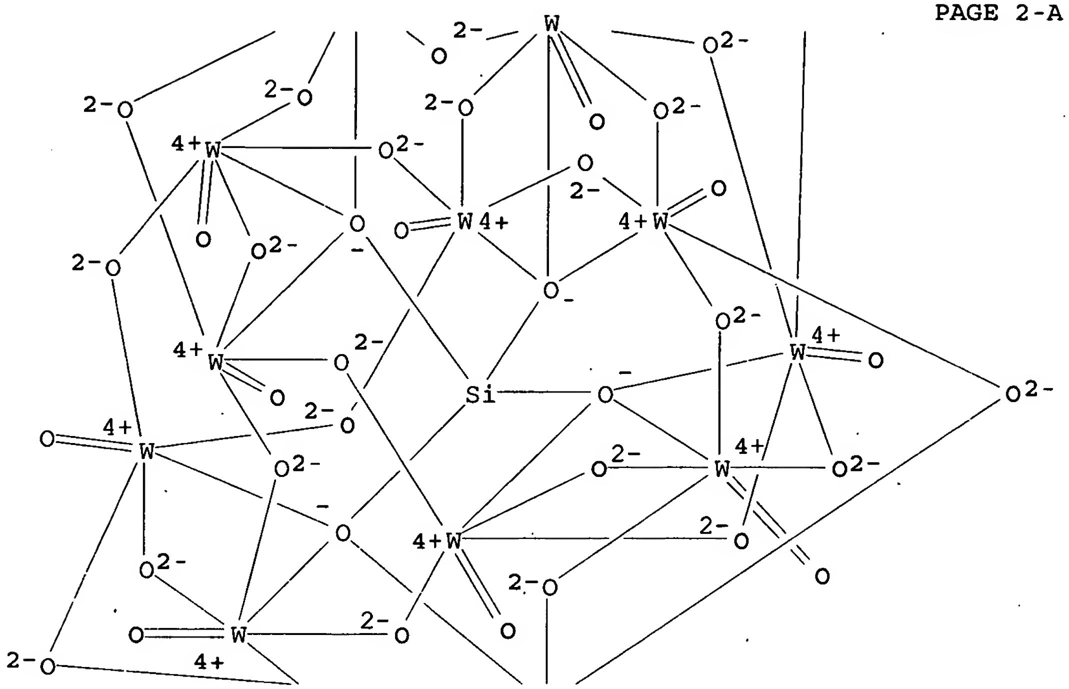
RN 692729-69-4 HCAPLUS

CN Tungstate(4-), [μ12-[orthosilicato(4-)-κO:κO:κO:.kapp
a.O':κO':κO':κO'':κO'':κO'':κO''':.kap
pa.O''':κO''']]tetracosa-μ-oxododecaoxododeca-, tetralithium, tridecahydrate (9CI) (CA INDEX NAME)

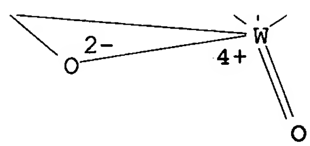
PAGE 1-A



PAGE 2-A



PAGE 3-A



●4 Li^+

●13 H_2O

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 8 OF 33 HCAPLUS
AN 2004:100613 HCAPLUS
DN 140:131168
TI Apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochemical devices
IN Benson, Martin H.; Neudecker, Bernd J.
PA ITN Energym Systems, Inc., USA

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SO    U.S. Pat. Appl. Publ., 25 pp.
      CODEN: USXXCO
DT    Patent
LA    English
FAN.CNT 1
      PATENT NO.            KIND    DATE        APPLICATION NO.        DATE
      ---------------       ----    --------    --------------------   --------
PI    US 2004023106          A1     20040205    US 2002-210180         20020802
      US 6770176             B2     20040803
      US 2004219434          A1     20041104    US 2004-840497         20040506
PRAI  US 2002-210180         A3     20020802
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AB An apparatus for use as a fracture absorption layer, an apparatus for use as an electrochem. device, and methods of manufacturing the same are disclosed. The apparatus and methods of the present invention may be of particular use in the manufacture of thin-film, lightwt., flexible or conformable, electrochem. devices such as **batteries**, and arrays of such devices. The present invention may provide many advantages including stunting fractures in a first electrochem. layer from propagating in a second electrochem. layer.

IC ICM H01M006-00

INCL 429122000; 429126000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST **battery** fabrication fracture absorption layer app; electrochem device fabrication fracture absorption layer app

IT Absorption
Electron beam evaporation
Fracture (materials)
Molecular beam epitaxy
Sputtering
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Fluoropolymers, uses
Polyesters, uses
Polyimides, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Vapor deposition process
(chemical; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Sol-gel processing
(coating; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Ion beams
(deposition; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Electric apparatus
(electrochem.; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Vapor deposition process
(electron-beam; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Evaporation
(flash, thermal; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Ceramics
Composites
(fracture absorption layer; apparatus and method for fracture absorption

layer for use in fabrication of thin-film electrochem. devices)
IT Metals, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fracture absorption layer; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Vapor deposition process
(ion plating, plasma; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Halogen compounds
Per compounds
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(perbromates, sputter target; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Halogen compounds
Per compounds
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(periodates, sputter target; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Vapor deposition process
(photochem.; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Vapor deposition process
(phys.; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Vapor deposition process
(plasma, arc, cathodic; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Laser radiation
(pulsed, deposition; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Coating process
(sol-gel; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Calcination
(spray; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Bromides, processes
Chlorides, processes
Fluorides, processes
Iodides, processes
Perchlorates
Selenides
Sulfates, processes
Sulfides, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(sputter target; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Semiconductor materials
(substrate; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Alloys, uses
Polymers, uses
Shape memory alloys
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)
IT Evaporation

(thermal; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Electrolytes
Primary **batteries**
(thin-film; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(thin-film; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT Lithium alloy, base
Tin alloy, base
RL: DEV (Device component use); USES (Uses)
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT 554-13-2, Lithium carbonate 1303-28-2, Arsenic oxide (As2O5) 1303-86-2, Boron oxide (B2O3), uses 1304-56-9, Beryllium oxide beo, uses 1306-38-3, Ceria, uses 1310-53-8, Germanium oxide (GeO2), uses 1314-23-4, Zirconia, uses 1314-36-9, Yttria, uses 1314-56-3, Phosphorus pentoxide, uses 1327-53-3, Arsenic oxide (As2O3) 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7440-20-2, Scandium, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-38-2, Arsenic, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-45-1, Cerium, uses 7440-56-4, Germanium, uses 7440-65-5, Yttrium, uses 7440-67-7, Zirconium, uses 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7631-86-9, Silica, uses 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses 7723-14-0D, Phosphorus, compound 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 9002-84-0, Ptfe 9003-39-8, Polyvinylpyrrolidone 10043-11-5, Boron nitride (BN), uses 10377-48-7, LIthium sulfate 10377-51-2, Lithium iodide 10377-52-3, LIthium phosphate 11118-04-0, Lithium phosphorus nitride Li7PN4 11126-15-1, Lithium vanadium oxide 12003-67-7, Aluminum lithium oxide allio2 12005-14-0, Aluminum lithium oxide al5lio8 12025-11-5, Germanium lithium oxide geli4o4 12033-89-5, Silicon nitride, uses 12057-24-8, Lithia, uses 12060-08-1, Scandium oxide (Sc2O3) 12065-36-0, Germanium nitride ge3n4 12136-91-3, Phosphorus nitride p3n5 12169-03-8, Lithium yttrium oxide liyo2 12209-15-3, Lithium scandium oxide lisco2 12232-41-6, Beryllium lithium oxide Be2Li2O3 12355-58-7, Aluminum lithium oxide alli5o4 12384-10-0, Lithium zirconium oxide li8zro6 12408-97-8, Boron lithium nitride BLi3N2 12521-45-8, Lithium silicon nitride LiSi2N3 12521-55-0, Lithium silicon nitride Li2SiN2 12521-66-3, Lithium silicon nitride Li8SiN4 13453-69-5, Lithium borate libo2 13453-84-4, Lithium silicon oxide li4sio4 13478-14-3, Lithium arsenate 14024-11-4, Aluminum lithium chloride AlLiCl4 14283-07-9, Lithium tetrafluoroborate 15138-76-8, Lithium tetrafluoroaluminate 17739-47-8, Phosphorus nitride pn 19497-94-0, Aluminum lithium silicate allisio4 21324-40-3, Lithium hexafluorophosphate 24304-00-5, Aluminum nitride Aln 25322-68-3, Polyethylene oxide 25658-42-8, Zirconium nitride (ZrN) 25764-13-0, Yttrium nitride (YN) 26134-62-3, Lithium nitride li3n 30622-39-0, LIthium titanium phosphate LiTi2(PO4)3 39300-70-4, Lithium nickel oxide 39449-52-0, Lithium oxide silicate (Li8O2(SiO4)) 39457-42-6, Lithium manganese oxide 56320-64-0 57349-02-7, Cerium lithium oxide celio2 60883-88-7, Lithium phosphorus nitride LiPN2 61027-73-4, Aluminum lithium nitride AlLi3N2 62795-18-0 66581-07-5 66581-08-6 67181-65-1, Lithium silicon nitride Li5SiN3 76068-31-0 87796-15-4, Lithium scandium phosphate Li3Sc2(PO4)3 **101993-97-9**, Lithium phosphate silicate Li3.6(PO4)0.4(SiO4)0.6 111706-40-2, Cobalt lithium oxide CoLi0-1O2 113957-82-7, Lithium silicon nitride Li21Si3N11 113957-83-8, Lithium silicon nitride Li18Si3N10 143080-25-5, Phosphorus

nitride oxide p4n6o 170171-06-9, Aluminum lithium fluoride AlLiF4 184905-46-2, Lithium nitrogen phosphorus oxide 651045-58-8, Lithium nitrogen phosphorus tin oxide
RL: DEV (Device component use); USES (Uses)
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT 7440-37-1, Argon, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT 7446-07-3, Tellurium oxide 7446-08-4, Selenium oxide seo2 7782-49-2, Selenium, processes 12031-80-0, Lithium oxide li2o2 12142-83-5, Tin nitride Sn3N4 12188-25-9, Lithium tin oxide li2sno3 12286-33-8, Tin phosphide Sn4P3 12344-15-9, Lithium tin oxide li8sno6 12372-55-3 12640-89-0, Selenium oxide 13451-18-8, Tellurium oxide teo3 13494-80-9, Tellurium, processes 13762-75-9, Lithium metaphosphate 13843-41-9, Lithium pyrophosphate 15578-26-4, Tin phosphate Sn2P2O7 15578-32-2, Tin phosphate Sn3(PO4)2 18282-10-5, Tin dioxide 23369-45-1, Phosphorus nitride oxide pno 25324-56-5, Tin phosphide SnP 37221-29-7, Sulfur nitride 37367-13-8, Tin phosphide SnP3 50645-72-2, Lithium tin phosphide Li5SnP3 50645-73-3, Lithium tin phosphide Li8SnP4 53680-59-4 102055-50-5, Lithium silicon nitride 116301-91-8, Phosphorous acid, trilithium salt 161286-52-8, Lithium sulfide thiosilicate (Li1.2S0.2(SiS3)0.4) 651045-60-2, Lithium phosphide (Li0-3P) 651045-62-4, Lithium nitride phosphide (Li10N10P) 651045-64-6, Lithium metaphosphate nitrate oxide (Li2.88(PO3)(NO3)0.14O0.31)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(sputter target; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(substrate; apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

IT **101993-97-9**, Lithium phosphate silicate Li3.6(PO4)0.4(SiO4)0.6
RL: DEV (Device component use); USES (Uses)
(apparatus and method for fracture absorption layer for use in fabrication of thin-film electrochem. devices)

RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 9 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:849411 HCAPLUS
DN 140:166649
TI Fabrication of thin-film microbatteries with Si-based negative electrode
AU Lee, Seung-Joo; Lee, Hee-Won; Lim, Jeong-Kyu; Kim, Young-Lae; Baik, Hong-Koo; Lee, Sung-Man
CS Dept. of Metallurgical Engineering, Yonsei University, Seoul, 120-749, S.

Korea
SO Proceedings - Electrochemical Society (2003), 2002-25(Micropower and Microdevices), 44-51
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society
DT Journal
LA English
AB Silicon-transition metal alloy thin films such as Si-V and Si-Zr are tested as an anode to replace lithium metal in a thin-film **battery** . The electrochem. characteristics of silicide film anodes appear very promising for use in microbatteries. A new all-solid-state thin film **battery** with the cell structure Si70V30/LiSiPON/LiCoO2 is fabricated by means of a sputtering method. The cell shows an excellent cycling stability over 1500 cycles when cycled between 2 and 3.9 V.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72, 76
ST **battery** micro silicon alloy film anode
IT **Battery** anodes
(fabrication of thin-film microbatteries with Si-based anodes)
IT Magnetron sputtering
(radio-frequency; fabrication of thin-film microbatteries with Si-based anodes)
IT Primary **batteries**
(solid-state, micro-; fabrication of thin-film microbatteries with Si-based anodes)
IT Alloys, uses
RL: DEV (Device component use); USES (Uses)
(thin-film; fabrication of thin-film microbatteries with Si-based anodes)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(fabrication of thin-film microbatteries with Si-based anodes)
IT 12190-79-3P, Cobalt lithium oxide (CoLiO2) 217196-48-0P, Silicon 70, vanadium 30 (atomic) **515815-74-4P**, Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28) 655238-52-1P
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fabrication of thin-film microbatteries with Si-based anodes)
IT 7439-93-2, Lithium, uses 7440-21-3, Silicon, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(fabrication of thin-film microbatteries with Si-based anodes)
IT 96-49-1, Ethylene carbonate 105-58-8, Diethylcarbonate 21324-40-3, Lithium hexafluorophosphate
RL: NUU (Other use, unclassified); USES (Uses)
(fabrication of thin-film microbatteries with Si-based anodes)
IT **515815-74-4P**, Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28)
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fabrication of thin-film microbatteries with Si-based anodes)
RN 515815-74-4 HCAPLUS
CN Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
O	1.1	17778-80-2

P	1	7723-14-0
Si	0.28	7440-21-3
Li	1.9	7439-93-2

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 10 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:573904 HCAPLUS
DN 140:62169
TI Electrical conductivity in Li-Si-P-O-N oxynitride thin-films
AU Lee, Seung-Joo; Bae, Jun-Hyun; Lee, Hee-Won; Baik, Hong-Koo; Lee, Sung-Man
CS Department of Metallurgical Engineering, Yonsei University, Seoul, 120-749, S. Korea
SO Journal of Power Sources (2003), 123(1), 61-64
CODEN: JPSODZ; ISSN: 0378-7753
PB Elsevier Science B.V.
DT Journal
LA English
AB N-containing Li silicophosphate (LiSiPON) thin-film electrolytes, which contain 2 glass-forming elements, are fabricated by sputtering from a (1-x)Li3PO4·xLi2SiO3 target in a N reactive plasma. The results of impedance measurements show that the activation energy for conduction decreases as the Si content increases, which increases the ionic conductivity of the films. These improvements in the elec. properties of the films are due to the combined effect of the mixed former and N incorporation. The decomposition potential of the electrolyte film in contact with Pt is .apprx.5.5 V.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium nitride oxide phosphide silicide electrolyte cond lithium **battery**
IT **Battery** electrolytes
(elec. conductivity of Li-Si-P-O-N thin-film electrolytes for lithium **batteries**)
IT **639079-90-6 639079-91-7**, Lithium nitride oxide phosphide silicate (Li1.9NO0.26P(SiO3)0.28) **639079-92-8**, Lithium nitride oxide phosphide silicate (Li2.9N1.26O0.1P(SiO4)0.35) **639079-93-9**, Lithium nitride oxide phosphide silicate (Li2.9N1.3O0.25P(SiO3)0.45)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(elec. conductivity of Li-Si-P-O-N thin-film **electrolytes** for lithium **batteries**)
IT **639079-90-6 639079-91-7**, Lithium nitride oxide phosphide silicate (Li1.9NO0.26P(SiO3)0.28) **639079-92-8**, Lithium nitride oxide phosphide silicate (Li2.9N1.26O0.1P(SiO4)0.35) **639079-93-9**, Lithium nitride oxide phosphide silicate (Li2.9N1.3O0.25P(SiO3)0.45)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(elec. conductivity of Li-Si-P-O-N thin-film **electrolytes** for lithium **batteries**)
RN 639079-90-6 HCAPLUS
CN Lithium phosphorus nitride oxide silicate (Li2.3PN1.1O0.6(SiO4)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1.1	17778-88-0
O	0.6	17778-80-2
O4Si	0.2	17181-37-2
P	1	7723-14-0
Li	2.3	7439-93-2

RN 639079-91-7 HCAPLUS
CN Lithium nitride oxide phosphide silicate (Li1.9NO0.26P(SiO3)0.28) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
O	0.26	17778-80-2
O3Si	0.28	15593-90-5
P	1	7723-14-0
Li	1.9	7439-93-2

RN 639079-92-8 HCAPLUS
CN Lithium nitride oxide phosphide silicate (Li2.9N1.26O0.1P(SiO4)0.35) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1.26	17778-88-0
O	0.1	17778-80-2
O4Si	0.35	17181-37-2
P	1	7723-14-0
Li	2.9	7439-93-2

RN 639079-93-9 HCAPLUS
CN Lithium nitride oxide phosphide silicate (Li2.9N1.3O0.25P(SiO3)0.45) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1.3	17778-88-0
O	0.25	17778-80-2
O3Si	0.45	15593-90-5
P	1	7723-14-0
Li	2.9	7439-93-2

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 11 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:413431 HCAPLUS
DN 139:136001
TI Lithium salts of heteropolyacid as the electrolyte of lithium-ion **battery**
AU Chen, Ya-Guang; Wang, Cun-Guo; Zhang, Xi-Yan; Xie, De-Ming; Wang, Rong-Shun
CS Faculty of Chemistry, Northeast Normal University, Changchun, 130024, Peop. Rep. China
SO Synthetic Metals (2003), 135-136, 225-226
CODEN: SYMEDZ; ISSN: 0379-6779
PB Elsevier Science B.V.
DT Journal
LA English
AB The lithium salts of heteropoly acids were prepared by ion-exchange method and characterized by IR and UV spectra and TG method. They were used as electrolyte of lithium-ion **batteries.** The discharge capacity

and the cycle life of the **batteries** with Li3PW12O40.nH2O and Li4SiW12O40.nH2O electrolytes were obviously improved in comparison with that of **battery** with LiClO4 electrolyte. The **battery** with Li3PW12O40 electrolyte has a stronger ability of maintaining its electricity capacity.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium heteropolyacid salt electrolyte ion secondary **battery** discharge capacity

IT Polyacenes
RL: DEV (Device component use); USES (Uses)
(PAS electrode composite with carbon black and PTFE; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT Carbon black, uses
RL: DEV (Device component use); USES (Uses)
(PAS- electrode composite with PTFE and polyacene; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(PAS- electrode composite with carbon black and polyacene; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT **Battery** electrodes
Battery electrolytes
Electric current-potential relationship
IR spectra
UV and visible spectra
(lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT Secondary **batteries**
(lithium; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT Electric conductivity
(of PC/DME/heteropolyacid solns.; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT Heteropoly acids
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(salts, lithium and potassium salts; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT 9002-84-0, PTFE
RL: DEV (Device component use); USES (Uses)
(PAS- electrode composite with carbon black and polyacene; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT 12363-31-4D, lithium salts, hydrated 12379-13-4D, lithium salts, hydrated 12534-77-9D, lithium salts, hydrated 29935-35-1 50927-64-5D, lithium salts, hydrated
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrolyte in PC/DME solution; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT 7791-03-9
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrolyte solution in PC/DME; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT 108-32-7, Propylene carbonate 115-10-6, Dimethyl ether
RL: DEV (Device component use); USES (Uses)
(electrolyte solvent; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); USES (Uses)
(foil electrode; lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

IT **86692-11-7P** 99582-24-8P
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(lithium salts of heteropolyacid as **electrolyte** of lithium-ion secondary **battery**)

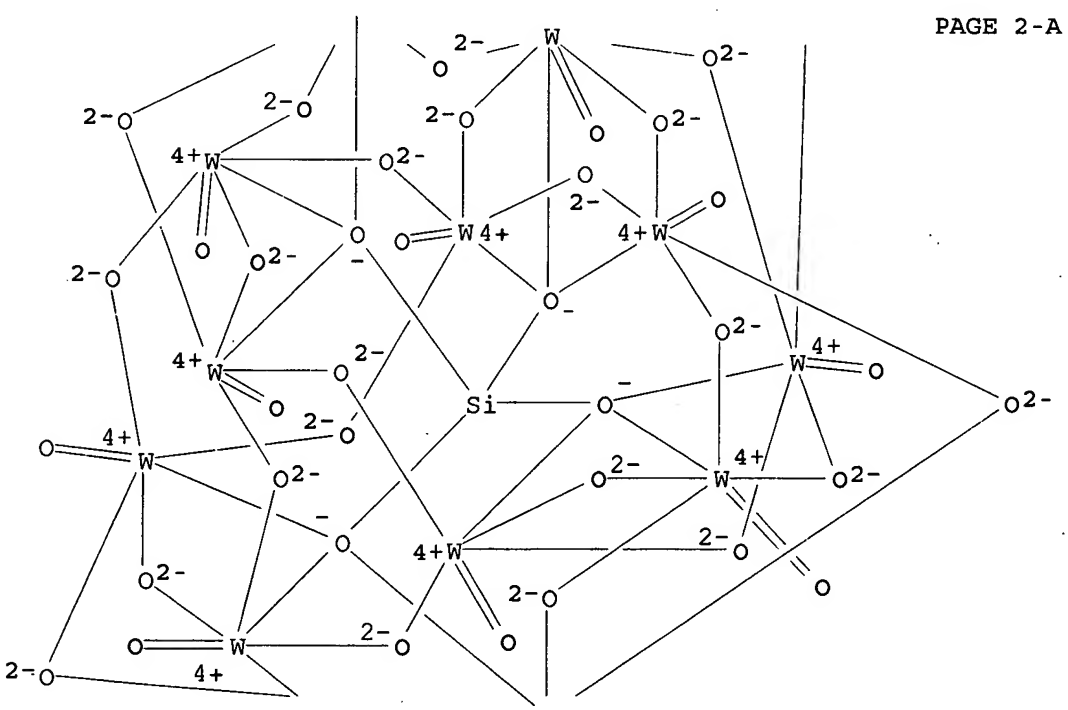
IT 12027-46-2P 12207-66-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(lithium salts of heteropolyacid as electrolyte of lithium-ion secondary **battery**)

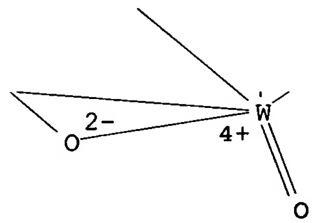
IT **86692-11-7P**
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(lithium salts of heteropolyacid as **electrolyte** of lithium-ion secondary **battery**)

RN 86692-11-7 HCAPLUS
CN Tungstate(4-), [μ12-[orthosilicato(4-)-κO:κO:κO:.kapp a.O':κO':κO':κO'':κO'':κO''':.kap pa.O''':κO''']]tetracosa-μ-oxododecaoxododeca-, tetralithium, hydrate (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A





PAGE 3-A

●4 Li^+

●x H_2O

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 12 OF 33 HCAPLUS
AN 2003:240248 HCAPLUS
DN 138:257892
TI Secondary **battery** sealed with insulating polymers and its manufacture
IN Higuchi, Hiroshi; Mino, Shinji; Ito, Shuji; Nanai, Norishige; Matsuda, Hiromu
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003092092	A2	20030328	JP 2001-283282	20010918
PRAI	JP 2001-283282		20010918		

AB The **battery** has a primary collector and a secondary collector sandwiching a cathode/solid electrolyte/anode laminate, wherein at least one of the collector is covered and peripheral sections of the covered parts are sealed with elec. insulating resins containing aromatic polyesters. The **battery** is manufactured by using solid electrolytes of (Li2S)x(SiS2)y(Li3PO4)1-x-y or (Li4SiO4)x(Li3PO4)1-x and/or Li3PO3-xNx and fixing the collectors with the resins by melting the resins and rapid-cooling at rate 100-150°/s. In the **battery**, water is shielded, adhesion between the collector and the sealant is improved, crystallization of the electrolytes is controlled by the rapid cooling process, and short circuit formation is prevented.
IC ICM H01M002-08
ICS H01M002-02; H01M004-64; H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST **battery** arom polyester insulator sealant; solid electrolyte **battery** collector sealing resin melting cooling
IT Polyesters, uses
RL: DEV (Device component use); USES (Uses)
(aromatic; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)

IT Cooling
(in melted resin sealant fixing process; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT Polyesters, uses
RL: DEV (Device component use); USES (Uses)
(liquid-crystalline, sealing with; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT Liquid crystals, polymeric
(polyesters, sealing with; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT Electric insulators
Secondary **batteries**
Solid electrolytes
(secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT **Battery** electrolytes
(solid; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT 1309-48-4, Magnesia, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 13463-67-7, Titania, uses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(filler in insulator; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT 503064-59-3, Vectra NP 50
RL: DEV (Device component use); USES (Uses)
(sealing with; secondary **battery** using solid electrolyte and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT 184905-46-2, Lithium nitrogen phosphorus oxide 196418-93-6, Lithium phosphate silicide sulfide **403704-59-6 502621-57-0**, Lithium phosphate silicate 502621-58-1, Lithium phosphorus nitride oxide (Li3PN1-2O2-3)
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte**; secondary **battery** using solid **electrolyte** and collector sealed with aromatic polyester-containing insulator and its manufacture)
IT **403704-59-6 502621-57-0**, Lithium phosphate silicate
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte**; secondary **battery** using solid **electrolyte** and collector sealed with aromatic polyester-containing insulator and its manufacture)
RN 403704-59-6 HCAPLUS
CN Lithium phosphate silicate, Li3-4[(PO4),(SiO4)] (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0 - 1	17181-37-2
O4P	0 - 1	14265-44-2
Li	3 - 4	7439-93-2

RN 502621-57-0 HCAPLUS
CN Lithium phosphate silicate (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O4Si	x	17181-37-2
O4P	x	14265-44-2
Li	x	7439-93-2

L21 ANSWER 13 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:970737 HCAPLUS
DN 138:340849
TI An all-solid-state thin film **battery** using LISIPON electrolyte and Si-V negative electrode films
AU Lee, Seung-Joo; Baik, Hong-Koo; Lee, Sung-Man
CS Department of Metallurgical Engineering, Yonsei University, Seoul, 120-749, S. Korea
SO Electrochemistry Communications (2003), 5(1), 32-35
CODEN: ECCMF9; ISSN: 1388-2481
PB Elsevier Science B.V.
DT Journal
LA English
AB A thin film **battery** has been fabricated by depositing a LiCoO2 pos. electrode, a Li1.9Si0.28P1.0O1.1N1.0 electrolyte, and a Si0.7V0.3 neg. electrode, sequentially. The electrochem. characteristics of the Si0.7V0.3 electrode and the elec. conductivity of the Li1.9Si0.28P1.0O1.1N1.0 electrolyte are investigated. The thin film **battery** mainly operates in the voltage range between 3 and 3.5 V. It exhibits excellent cycling stability when cycled between 2.0 and 3.9 V, while the **battery** performance is abruptly deteriorated when the charge cutoff voltage is extended to 4.2 V.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST lithium silicon phosphorus nitride oxide electrolyte thin film **battery**
IT **Battery** cathodes
(LiCoO2; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT **Battery** electrolytes
(Li1.9NPSi0.28O1.1; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT **Battery** anodes
(Si70V30; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT Secondary **batteries**
(lithium; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT 217196-48-0, Silicon 70, vanadium 30 (atomic)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**battery** anode; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT 12190-79-3, Cobalt lithium oxide CoLiO2
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**battery** cathode; all-solid-state thin film **battery** using Co-Li-Si-P-N-O electrolyte and Si-V neg. electrode films)
IT **515815-74-4**, Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**battery electrolyte**; all-solid-state thin film **battery** using Co-Li-Si-P-N-O **electrolyte** and Si-V neg. electrode films)
IT **515815-74-4**, Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28)

RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**battery electrolyte**; all-solid-state thin film **battery** using Co-Li-Si-P-N-O **electrolyte** and Si-V neg. electrode films)
RN 515815-74-4 HCAPLUS
CN Lithium nitride oxide phosphide silicide (Li1.9NO1.1PSi0.28) (9CI) (CA INDEX NAME)

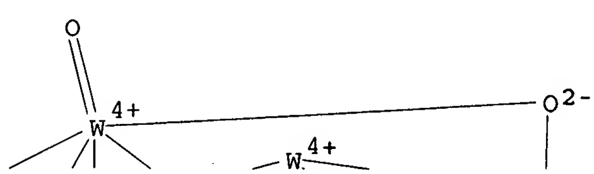
Component	Ratio	Component Registry Number
N	1	17778-88-0
O	1.1	17778-80-2
P	1	7723-14-0
Si	0.28	7440-21-3
Li	1.9	7439-93-2

RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

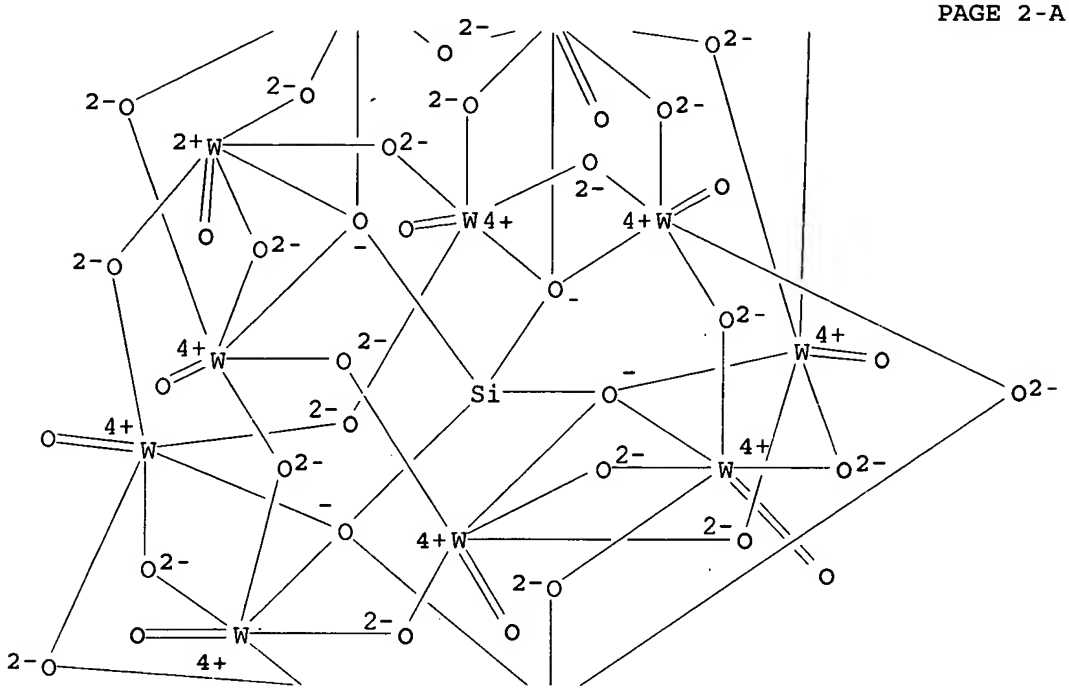
L21 ANSWER 14 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:916776 HCAPLUS
DN 138:323871
TI A novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous electrolytes in polyacenic semiconductor secondary **batteries**
AU Wang, Xiuli; Wang, Enbo; Xie, Demin; Zhang, Xiyan; Hu, Changwen; Xu, Lin
CS Institute of Polyoxometalate Chemistry, Department of Chemistry, Northeast Normal University, Changchun, 130024, Peop. Rep. China
SO Solid State Ionics (2003), 156(1,2), 71-78
CODEN: SSIOD3; ISSN: 0167-2738
PB Elsevier Science B.V.
DT Journal
LA English
AB Mixed-valence Keggin-type lithium polyoxometalates (POMs) were used as the electrolytes of polyacenic semiconductor (PAS) secondary **batteries** substituting for LiClO4 for the first time. The discharging, cycle and self-discharging properties of these PAS/Li secondary **batteries** and the effect of c.d. and temperature on the properties of the **batteries** have been investigated. The results indicate not only that the lithium POMs can overcome the disadvantages of LiClO4, which is apt to explode when heated or rammed, but also that some of the PAS/Li secondary **batteries** assembled with the novel electrolytes have larger capacity and smaller self-discharging than that assembled with LiClO4. Therefore, it is believed that Keggin-type mixed-valence lithium POMs are novel and better electrolytes of PAS secondary **batteries** and exhibit promising practical application.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium tungsten oxide phosphate electrolyte lithium **battery**; silicate lithium tungsten oxide electrolyte lithium **batteries**; molybdenum lithium oxide phosphate silicate electrolyte lithium **batteries**
IT Secondary **batteries**
(lithium; novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous electrolytes in polyacenic semiconductor secondary **batteries**)
IT **Battery** electrolytes
(novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous electrolytes in polyacenic semiconductor secondary **batteries**)

IT Heteropoly acids
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous electrolytes in polyacenic semiconductor secondary **batteries**)
IT 514202-37-0 **514202-38-1** 514202-49-4
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**electrolytes**; novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous **electrolytes** in polyacenic semiconductor secondary **batteries**)
IT 514202-39-2, Lithium molybdenum oxide phosphate (Li5Mo12O36(PO4))
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous electrolytes in polyacenic semiconductor secondary **batteries**)
IT **514202-38-1**
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**electrolytes**; novel application of mixed-valence Keggin-type polyoxometalates as non-aqueous **electrolytes** in polyacenic semiconductor secondary **batteries**)
RN 514202-38-1 HCAPLUS
CN Tungstate(6-), [μ12-[orthosilicato(4-)-κO:κO:κO:.kapp
a.O':κO':κO':κO'':κO'':κO'':κO''':.kap
pa.O''':κO''']]tetracosa-μ-oxododecaoxododeca-, hexalithium (9CI)
(CA INDEX NAME)

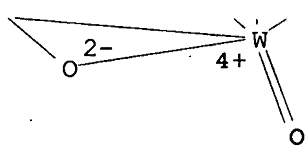
PAGE 1-A



PAGE 2-A



PAGE 3-A



● 6 Li^+

RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 15 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:45326 HCAPLUS
DN 136:328026
TI All-solid-state thick-film **battery**
AU He, Hongpeng; Weppner, W.
CS Faculty of Engineering, Chr.-Albrechts University, Kiel, 24143, Germany
SO Ionics (2001), 7(4, 5 & 6), 469-474
CODEN: IONIFA; ISSN: 0947-7047
PB Institute for Ionics
DT Journal
LA English
AB An all-solid-state Li-ion secondary **battery** based on
Li/LiSiPO/LiCoO2 has been developed and the cell performance has been
evaluated. The electrolyte and cathode were fabricated by tape casting.

The charge and discharge behavior of the cell at constant current was investigated in view of the fact of lower conductivities of solid conductors compared to liquid electrolytes and the internal resistance of the solid-solid interface. Solns. to these problems have been investigated by varying the fabrication methods. A major advantage was the application of pyrolyzable pore formers in the cathode green tape in order to produce a porous cathode matrix. The interfacial contacts between solid electrolytes and electrodes can be greatly improved. Also, the internal resistance may be further decreased by tape casting of thinner electrolyte films. In conclusion, the tape casting method is very promising for the development of high performance all-solid-state Li-ion **batteries.**

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium secondary **battery** high performance tape casting
IT **Battery** cathodes
(LiSiPO,; all-solid-state thick-film **battery**)
IT Secondary **batteries**
(lithium, high performance,; all-solid-state thick-film **battery**
)
IT 12190-79-3, Cobalt lithium oxide $LiCoO_2$
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(all-solid-state thick-film **battery**)
IT **184226-84-4**, Lithium phosphorus silicon oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(cathode,; all-solid-state thick-film **battery**)
IT **184226-84-4**, Lithium phosphorus silicon oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(cathode,; all-solid-state thick-film **battery**)
RN 184226-84-4 HCAPLUS
CN Lithium phosphorus silicon oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
P	x	7723-14-0
Si	x	7440-21-3
Li	x	7439-93-2

RE.CNT 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 16 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:671907 HCAPLUS
DN 136:40116
TI Solid electrolyte for thin film energy storage devices
AU Huang, Yuhong; Jiang, Gengwei; West, William; Hill, Craig
CS Chemat Technology, Inc., Northridge, CA, 91324, USA
SO Proceedings of the Intersociety Energy Conversion Engineering Conference (2001), 36th(Vol. 2), 887-889
CODEN: PIECDE; ISSN: 0146-955X
PB Society of Automotive Engineers
DT Journal
LA English
AB There is a need for the development of solid-state micro power sources with both high power and high energy d. as a new type of power supply for advanced consumer electronics, MEMS, sensors, computer equipment and

communication systems. To satisfy the requirements of a compact and lightwt. power supply, thin film **batteries** are under consideration as candidates for the hybrid power sources. A novel solid electrolyte based on polyoxometalates has been studied for thin film energy storage devices. This class of nano-cluster materials show considerable potential in both proton and lithium ion solid electrolyte conductive coatings. A spin-on thin film deposition process was developed in this research.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72

ST solid electrolyte polyoxometalate film lithium **battery**

IT Heteropoly acids
RL: DEV (Device component use); USES (Uses)
(lithium salts; solid electrolyte for thin film energy storage devices)

IT Ionic conductivity
(solid electrolyte for thin film energy storage devices)

IT **Battery** electrolytes
(solid; solid electrolyte for thin film energy storage devices)

IT Coating process
(spin; solid electrolyte for thin film energy storage devices)

IT 12026-95-8, Lithium tungstophosphate li3pw12o40 82691-60-9 83084-35-9 **84259-22-3**, Lithium tungstosilicate li4siw12o40 **93279-92-6** 138597-47-4 379686-96-1 379686-97-2
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte** for thin film energy storage devices)

IT **84259-22-3**, Lithium tungstosilicate li4siw12o40 **93279-92-6**
RL: DEV (Device component use); USES (Uses)
(solid **electrolyte** for thin film energy storage devices)

RN 84259-22-3 HCAPLUS

CN Tungstate(4-), [μ12-[orthosilicato(4-)-κO:κO:κO:.kapp
a.O':κO':κO':κO'':κO'':κO'':κO''':.kap
pa.O''':κO''']]tetracosa-μ-oxododecaoxododeca-, tetralithium
(9CI) (CA INDEX NAME)

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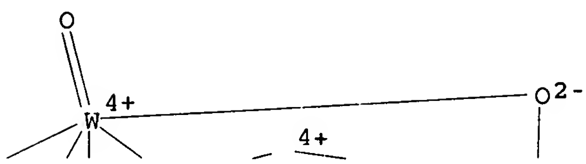

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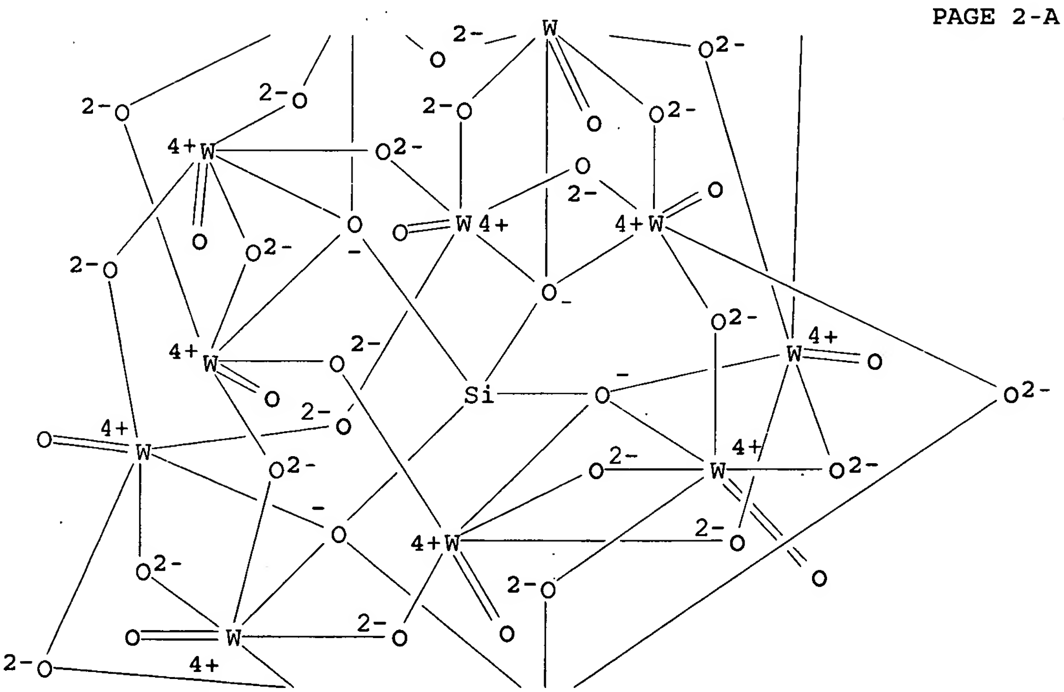

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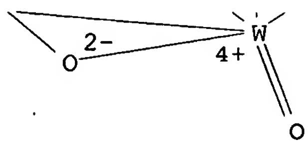
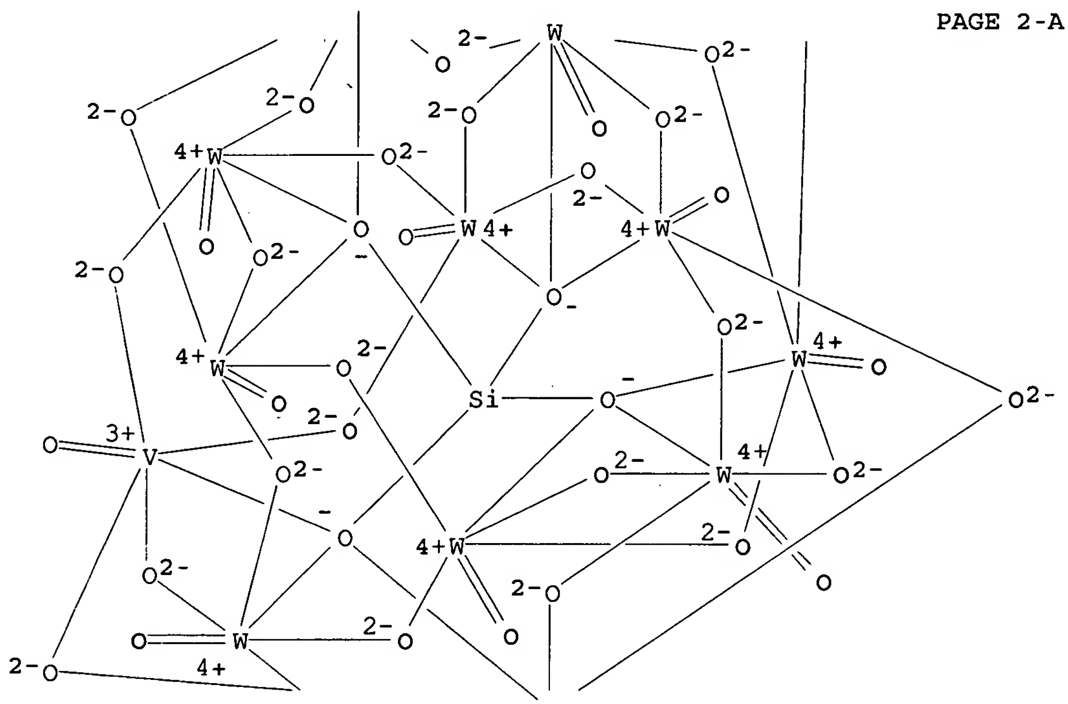


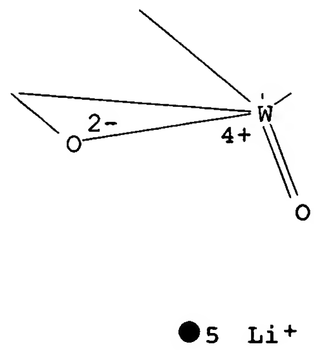
● 4 Li^+

RN 93279-92-6 HCAPLUS
CN Vanadate(5-), (eicosa-μ-oxoundecaoxoundecatungstate)[μ12-[orthosilicato(4-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-μ-oxooxo-, pentalithium (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A





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RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 17 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2001:179635 HCAPLUS
DN 134:210518
TI Process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in the film technology
IN Meislitzer, Karl Heinz
PA Bangert, Wolfgang, Germany; Sebastian, Rudolf
SO Ger. Offen., 12 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 19941861	A1	20010315	DE 1999-19941861	19990902
PRAI	DE 1999-19941861		19990902		

AB Films for cathodes and anodes as well as for the electrolytes are pulled from pastes of suitable composition and preparation Cathode pastes are prepared from: 3-10% polymer or copolymer, PEO, polystyrene, polyvinyl chloride. polyvinylidene fluoride, or polyvinylidene fluoride-hexaflupropropylene copolymer (PVDF-HFP); 4-12% plasticizer (e.g., dibutylphthalate or dioctyl phthalate); 20-60 g% intercalation material (e.g., LiCoO2, LiNiO2, LiCoxNi1-xO2, LiMn2O4 or VOx); 2-10% elec. conductor (e.g., graphite powder or amorphous C); and 40-80% solvent (e.g., acetone). Anode paste comprises: 3-10% polymer or copolymer (e.g., PEO, polystyrene, PVC, PVDF, or PVDF-HFP copolymer), 4-12% plasticizer (di-Bu phthalate or dioctyl phthalate), 20-40% elec. conductor (graphite powder or amorphous C), and 40-80% solvent (acetone). The electrolyte paste comprises: 3-10 g% polymer or copolymer (PEO, polystyrene, PVC, PVDF or hexafluoropropylene-vinylidene fluoride copolymer), 4-12% plasticizer (DBP or DOP), 20-40% ionic conductor (Li9AlSiO8, Li1.3Al0.3Ti1.7(PO4)3, LiTi2(PO4)3, Li2O or Li4SiO4.Li3PO4), 2-10% ionic conductor (LiClO4, LiBF4, LiCl, LiBr, or LiI) and 40-80 g% solvent (acetone).
IC ICM H01M004-04
ICS H01M004-62; H01M004-48
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium polymer electrolyte **battery** prodn film technol
IT Polyurethanes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(acrylates, coatings; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)

IT Secondary **batteries**
(lithium; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT **Battery** anodes
Battery cathodes
Films
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT Fluoropolymers, uses
Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 7440-44-0, Carbon, uses
RL: MOA (Modifier or additive use); USES (Uses)
(amorphous; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 7440-50-8, Copper, uses
RL: DEV (Device component use); USES (Uses)
(film, current collector; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 84-74-2, Dibutyl phthalate 117-84-0, Dioctyl phthalate
RL: DEV (Device component use); USES (Uses)
(plasticizer; process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 9002-86-2, Polyvinyl chloride 9003-53-6, Polystyrene 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 11099-11-9, Vanadium oxide 12031-65-1, Lithium nickel oxide linio2 12057-17-9, Lithium manganese oxide limn2o4 12190-79-3, Cobalt lithium oxide colio2 24937-79-9, Polyvinylidene fluoride 25322-68-3, Peo 131344-56-4, Cobalt lithium nickel oxide
RL: DEV (Device component use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 30622-39-0, Lithium titanium phosphate LiTi2(PO4)3 120479-61-0, Aluminum lithium titanium phosphate Al0.3Li1.3Ti1.7(PO4)3 **138728-82-2**, Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5) 180728-17-0, Aluminum lithium oxide silicate (AlLi9O4(SiO4)) 328899-26-9, Lithium titanium oxide phosphate (Li3Ti2O(PO4)3)
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid **electrolytes** in film technol.)
IT 7782-42-5, Graphite, uses
RL: MOA (Modifier or additive use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT 67-64-1, Acetone, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid electrolytes in film technol.)
IT **138728-82-2**, Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5)
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(process for large scale fabrication of lithium polymer **batteries** with solid **electrolytes** in film technol.)

RN 138728-82-2 HCAPLUS
CN Lithium phosphate silicate (Li3.5(PO4)0.5(SiO4)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	0.5	14265-44-2
Li	3.5	7439-93-2

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 18 OF 33 HCAPLUS
AN 2000:774123 HCAPLUS
DN 133:352634
TI Electrode materials having increased surface conductivity
IN Ravet, Nathalie; Besner, Simon; Simoneau, Martin; Vallee, Alain; Armand, Michel; Magnan, Jean-francois
PA Hydro-Quebec, Can.
SO Eur. Pat. Appl., 22 pp.
CODEN: EPXXDW
DT Patent
LA French
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1049182	A2	20001102	EP 2000-401207	20000502
	EP 1049182	A3	20040211		
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	CA 2270771	AA	20001030	CA 1999-2270771	19990430
	CA 2307119	AA	20001030	CA 2000-2307119	20000428
	JP 2001015111	A2	20010119	JP 2000-132779	20000501
	US 2002195591	A1	20021226	US 2002-175794	20020621
	US 6855273	B2	20050215		
	US 2004140458	A1	20040722	US 2003-740449	20031222
PRAI	CA 1999-2270771	A	19990430		
	US 2000-560572	B1	20000428		
	US 2002-175794	A3	20020621		

AB Intercalated electrode materials comprising complex oxides, especially Li oxides, are prepared, suitable for redox reaction by exchange of alkali metal ions (especially Li) and electrons with an electrolyte. The complex oxide electrodes can be used in **batteries**, supercapacitors or electrochromic light moderators. The complex oxides have the general formula AaMmZzOoNnFf, where A is alkali metal (e.g., Li), M is ≥1 transition metal (e.g., Fe, Mn, V, Ti, Mo, Nb, Zn, W), Z is ≥1 nonmetal (e.g., P, S, Si, Se, As, Ge, B, Sn), and a,m,z,o,n,f are chosen for elec. neutrality. A conductive carbon coating is formed or deposited on the surface of the electrode material, e.g., by pyrolysis of an organic material, hydrocarbons or polymers, for increased surface conductivity

LiNbSiO

IC ICM H01M004-58
ICS H01M004-48; H01M004-62
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57, 72, 76
ST electrode material carbon coated increased surface cond; **battery** electrode carbon coated increased surface cond; supercapacitor electrode carbon coated increased surface cond; electrochromic material carbon coated increased surface cond
IT Metallic fibers

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(aluminum; electrode materials having increased surface conductivity)
IT Windows
Windows
(electrochromic; electrode materials having increased surface conductivity)
IT **Battery** cathodes
Capacitor electrodes
Electrochromic materials
Electrodes
Primary **batteries**
Secondary **batteries**
Thermal decomposition
(electrode materials having increased surface conductivity)
IT Oxides (inorganic), uses
Oxynitrides
Phosphates, uses
Silicates, uses
Sulfates, uses
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrode materials having increased surface conductivity)
IT Carbon black, uses
EPDM rubber
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode materials having increased surface conductivity)
IT Hydrocarbons, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)
IT Organic compounds, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)
IT Polymers, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)
IT Polyolefins
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)
IT Polysaccharides, reactions
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)
IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(electrolytes; electrode materials having increased surface conductivity)
IT Primary **batteries**
Secondary **batteries**
(lithium; electrode materials having increased surface conductivity)
IT Fluorides, uses
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(oxyfluorides; electrode materials having increased surface conductivity)
IT Electrolytic capacitors
(supercapacitors; electrode materials having increased surface conductivity)

IT Electrochromic devices
Electrochromic devices
(windows; electrode materials having increased surface conductivity)
IT 7440-44-0P, Carbon, uses 15365-14-7P, Iron lithium phosphate (FeLiPO4) 30734-08-8P, Lithium manganese silicate Li2MnSiO4 39302-37-9P, Lithium titanium oxide 180984-63-8P, Lithium magnesium titanium oxide **252943-50-3P**, Lithium vanadium phosphate silicate Li3.5V2(PO4)2.5(SiO4)0.5 304905-30-4P 304905-31-5P, Iron lithium fluoride (FeLi0.2F3) 304905-32-6P, Lithium manganese nitride oxide (Li3MnNO) 304905-33-7P 304905-34-8P 304905-35-9P, Lithium magnesium titanium oxide (Li3.5Mg0.5Ti4O12) 304905-36-0P, Iron lithium phosphorus silicon oxide **304905-37-1P** 304905-38-2P, Iron lithium phosphorus fluoride oxide 304905-39-3P 304905-40-6P 304905-41-7P 304905-42-8P
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrode materials having increased surface conductivity)
IT 1314-35-8, Tungsten oxide WO3, uses 7782-42-5, Graphite, uses 50926-11-9, Indium tin oxide 65324-39-2, Celgard 2400
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electrode materials having increased surface conductivity)
IT 1333-74-0, Hydrogen, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(electrode materials having increased surface conductivity)
IT 78-10-4 109-72-8, Butyl lithium, uses 546-68-9 553-91-3, Lithium oxalate 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide 1344-43-0, Manganese oxide MnO, uses 5931-89-5, Cobalt acetate 5965-38-8, Cobalt oxalate dihydrate 6108-17-4, Lithium acetate dihydrate 6156-78-1, Manganese acetate tetrahydrate 6556-16-7, Manganese oxalate dihydrate 7722-76-1, Ammonium dihydrogen phosphate 7783-50-8, Iron fluoride FeF3 7803-55-6, Ammonium vanadate 9003-01-4, Polyacrylic acid 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 10028-22-5, Ferric sulfate 10102-24-6, Lithium silicate Li2SiO3 10377-52-3, Lithium phosphate Li3PO4 13463-10-0, Ferric phosphate dihydrate 14567-67-0, Vivianite 16674-78-5, Magnesium acetate tetrahydrate 25656-42-2, Lithium polyacrylate 26134-62-3, Lithium nitride 145673-07-0
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(electrode materials having increased surface conductivity)
IT 304905-43-9 305324-61-2
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(electrode materials having increased surface conductivity)
IT 57-50-1, reactions 77-47-4, Hexachlorocyclopentadiene 98-00-0D, Furfuryl alcohol, derivs., polymers 100-42-5D, Styrene, derivs., polymers 107-13-1D, Acrylonitrile, derivs., polymers 108-05-4D, Vinyl acetate, derivs., polymers 108-95-2D, Phenol, derivs., polymers, reactions 115-07-1, 1-Propene, reactions 120-12-7, Anthracene, reactions 128-69-8D, 3,4,9,10-Perylenetetracarboxylic acid dianhydride, polymers with Jeffamine 600 198-55-0D, Perylene, derivs., polymers 630-08-0, Carbon monoxide, reactions 996-70-3, Tetrakis(dimethylamino)ethylene 1321-74-0D, Divinylbenzene, derivs., polymers 6674-22-2, DBU 9002-88-4 9002-89-5 9003-07-0, Polypropylene 9003-17-2D, Polybutadiene, derivs. 9004-34-6D, Cellulose, derivs., reactions 9004-35-7, Cellulose acetate 9005-25-8D, Starch, derivs., reactions 15133-82-1, Tetrakis(triphenylphosphine)nicke

1 25014-41-9, Polyacrylonitrile 51736-72-2, Polyvinylidene bromide
157889-12-8, Jeffamine ED 600-perylenetetracarboxylic acid dianhydride copolymer
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode materials having increased surface conductivity)

IT 75-05-8, Acetonitrile, uses 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 110-71-4 616-38-6, Dimethyl carbonate 646-06-0, Dioxolane 2832-49-7, Tetraethylsulfamide 21324-40-3, Lithium hexafluorophosphate LiPF6 25322-68-3 66950-70-7 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(electrolytes; electrode materials having increased surface conductivity)

IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(foils, grills; electrode materials having increased surface conductivity)

IT 7439-93-2, Lithium, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(foils; electrode materials having increased surface conductivity)

IT 7440-50-8, Copper, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(grills; electrode materials having increased surface conductivity)

IT 7440-02-0, Nickel, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(substrates; electrode materials having increased surface conductivity)

IT **252943-50-3P**, Lithium vanadium phosphate silicate Li3.5V2(PO4)2.5(SiO4)0.5 **304905-37-1P**
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(electrode materials having increased surface conductivity)

RN 252943-50-3 HCAPLUS
CN Lithium vanadium phosphate silicate (Li3.5V2(PO4)2.5(SiO4)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
V	2	7440-62-2
Li	3.5	7439-93-2

RN 304905-37-1 HCAPLUS
CN Lithium manganese phosphorus silicon oxide (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
P	x	7723-14-0
Si	x	7440-21-3
Mn	x	7439-96-5
Li	x	7439-93-2

L21 ANSWER 19 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:15552 HCAPLUS
DN 132:52431
TI Method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**
IN Barker, Jeremy
PA Valence Technology, Inc., USA
SO PCT Int. Appl., 46 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000001024	A1	20000106	WO 1999-US11217	19990520
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6136472	A	20001024	US 1998-105748	19980626
	CA 2333577	AA	20000106	CA 1999-2333577	19990520
	AU 9940918	A1	20000117	AU 1999-40918	19990520
	EP 1090435	A1	20010411	EP 1999-924410	19990520
	EP 1090435	B1	20040804		
	R: DE, ES, FR, GB, IT, IE				
	JP 2002519836	T2	20020702	JP 2000-557507	19990520
	EP 1282181	A2	20030205	EP 2002-25070	19990520
	EP 1282181	A3	20050330		
	R: DE, ES, FR, GB, IT, IE				
	HK 1036883	A1	20050429	HK 2001-105569	20010810
PRAI	US 1998-105748	A1	19980626		
	EP 1999-924410	A3	19990520		
	WO 1999-US11217	W	19990520		

AB The invention provides a new electrode active material and cells and **batteries** which utilize such active material. The active material is represented by the nominal general formula LiaM'(2-b)M"bSicP(3-c)O12, 0 ≤ b ≤ 2, 0 < c < 3. M' and M" are each elements selected from the group consisting of metal and metalloid elements. The value of the variable a depends upon the selection of M' and M" and on the relative proportions designated as b and c.
IC ICM H01M004-58
ICS H01M010-40; C01B025-45
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery** electrode active material lithium contg silicophosphate
IT Secondary **batteries**
(lithium; method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**)
IT **Battery** cathodes
(method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**)
IT Phosphates, uses
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(silico-; method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**)
IT **252943-44-5**, Lithium vanadium phosphate silicate

(Li3V2(PO4)2(SiO4)) 252943-46-7 252943-47-8 252943-48-9
252943-49-0 **252943-50-3**, Lithium vanadium phosphate silicate
(Li3.5V2(PO4)2.5(SiO4)0.5) 252943-51-4
RL: DEV (Device component use); USES (Uses)
(method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**)

IT **252943-44-5**, Lithium vanadium phosphate silicate
(Li3V2(PO4)2(SiO4)) **252943-50-3**, Lithium vanadium phosphate silicate (Li3.5V2(PO4)2.5(SiO4)0.5)
RL: DEV (Device component use); USES (Uses)
(method of preparation of lithium-containing silicophosphates for electrode active material of lithium **batteries**)

RN 252943-44-5 HCAPLUS
CN Lithium vanadium phosphate silicate (Li3V2(PO4)2(SiO4)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	1	17181-37-2
O4P	2	14265-44-2
V	2	7440-62-2
Li	3	7439-93-2

RN 252943-50-3 HCAPLUS
CN Lithium vanadium phosphate silicate (Li3.5V2(PO4)2.5(SiO4)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
V	2	7440-62-2
Li	3.5	7439-93-2

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 20 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:274505 HCAPLUS
DN 129:56449
TI Electron beam evaporated thin film electrodes and electrolytes for lithium microbatteries
AU Birke, P.; Doring, S.; Scharner, S.; Weppner, W.
CS Department of Sensors and Solid State Ionics, Faculty of Engineering, Christian Albrechts University, Kiel, D-24143, Germany
SO Proceedings - Electrochemical Society (1998), 97-24(Ionic and Mixed Conducting Ceramics), 690-699
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society
DT Journal
LA English
AB Starting materials (0.44 LiBO2·0.56 LiF, LiF, Li3PO4, Li3.6Si0.6P0.4O4 and LiB0.44O0.88F0.56) have been electron beam evaporated and investigated for possible applications as thin film electrolytes in all solid state rechargeable microbatteries. The main criteria for suitability as thin film solid electrolyte have been reproducible results, very high electronic resistivity and high evaporation rates. C and LiCoO2 starting materials have been electron beam evaporated in order to improve the

diffusivity compared to rf sputtered electrode films. A new non equilibrium method for estimating the chemical diffusion coefficient D in thin film electrodes has been developed.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** electrode electrolyte; electron beam evapn electrode electrolyte **battery**; microbattery electrode electrolyte electron beam evapn

IT **Battery** electrodes
Battery electrolytes
Electron beam evaporation
(electron beam evaporated thin film electrodes and electrolytes for lithium microbatteries)

IT Glass, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(lithium borate fluoride; electron beam evaporated thin film electrodes and electrolytes for lithium microbatteries)

IT 7789-24-4, Lithium fluoride, uses 10377-52-3, Lithium phosphate Li3PO4 13453-69-5, Lithium borate libo2 **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electron beam evaporated thin film electrodes and **electrolytes** for lithium microbatteries)

IT **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(electron beam evaporated thin film electrodes and **electrolytes** for lithium microbatteries)

RN 101993-97-9 HCAPLUS

CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 21 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:174725 HCAPLUS

DN 128:182507

TI Comparison between rf-sputtered and electron beam evaporated thin electrode and electrolyte films for application in rechargeable lithium microbatteries

AU Doring, S.; Birke, P.; Weppner, W.

CS Department for Sensors and Solid State Ionics, Christian-Albrechts-University, Kiel, D-24143, Germany

SO Ionics (1997), 3(3 & 4), 184-193
CODEN: IONIFA; ISSN: 0947-7047

PB Institute for Ionics

DT Journal

LA English

AB The electrochem. performance of ion conducting thin films depends strongly on the deposition method. This provides a possibility of tailoring thin films with new functional properties. A comparative study was made between rf-sputtering and electron beam evaporation which are the two most

commonly employed methods for the preparation of thin films. For this purpose, thin films of Li3±xPO4±yNz were rf-sputtered and electron beam evaporated and investigated with regard to the electrochem. properties. It was found that solid thin films of the electrolyte Li3±xPO4±yNz may be sputtered, but not electron beam evaporated Compared to rf-sputtered Li1±xCoO2±y and C thin films, electron beam evaporated Li1±xCoO2±y and C thin films show chemical diffusion coeffs. which are at least one order of magnitude higher.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium microbattery electrode electrolyte film; electron beam evapd thin electrode **battery**

IT **Battery** electrodes
 Battery electrolytes
Diffusion
Electric conductivity
Electron beams
Ionic conductivity
 (comparison between rf-sputtered and electron beam evaporated thin electrode and electrolyte films for application in rechargeable lithium microbatteries)

IT Secondary **batteries**
 (lithium; comparison between rf-sputtered and electron beam evaporated thin electrode and electrolyte films for application in rechargeable lithium microbatteries)

IT Sputtering
 (radio-frequency; comparison between rf-sputtered and electron beam evaporated thin electrode and electrolyte films for application in rechargeable lithium microbatteries)

IT 12190-79-3, Cobalt lithium oxide (CoLiO2)
RL: DEV (Device component use); USES (Uses)
 (comparison between rf-sputtered and electron beam evaporated thin electrode and electrolyte films for application in rechargeable lithium microbatteries)

IT 7440-44-0P, Carbon, uses 52627-24-4P, Cobalt lithium oxide
203308-84-3P, Lithium phosphate silicate (Li3.6(PO4)0.6(SiO4)0.4)
203402-92-0P, Lithium nitride phosphate
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (comparison between rf-sputtered and electron beam evaporated thin electrode and **electrolyte** films for application in rechargeable lithium microbatteries)

IT **203308-84-3P**, Lithium phosphate silicate (Li3.6(PO4)0.6(SiO4)0.4)
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
 (comparison between rf-sputtered and electron beam evaporated thin electrode and **electrolyte** films for application in rechargeable lithium microbatteries)

RN 203308-84-3 HCAPLUS

CN Lithium phosphate silicate (Li3.6(PO4)0.6(SiO4)0.4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.4	17181-37-2
O4P	0.6	14265-44-2
Li	3.6	7439-93-2

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L21 ANSWER 22 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1996:372437 HCAPLUS
DN 125:119400
TI Thin-film rechargeable lithium **batteries**
AU Dudney, N. J.; Bates, J. B.; Lubben, Dan
CS Solid State Division, Oak Ridge National Laboratory, Oak Ridge, TN, 37831-6030, USA
SO Ceramic Transactions (1996), 65(Role of Ceramics in Advanced Electrochemical Systems), 113-127
CODEN: CETREW; ISSN: 1042-1122
PB American Ceramic Society
DT Journal
LA English
AB Thin-film rechargeable lithium **batteries** using ceramic electrolyte and cathode materials were fabricated by phys. deposition techniques. The lithium phosphorus oxynitride electrolyte has exceptional electro-chemical stability and a good lithium conductivity The lithium insertion reaction of several different intercalation materials, amorphous V2O5, amorphous LiMn2O4, and crystalline LiMn2O4 films, was investigated using the cathode/electrolyte/lithium thin-film **battery.**
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium thin film **battery** manuf; phosphorus lithium oxynitride electrolyte **battery** manuf; manganese lithium oxide cathode **battery** manuf; vanadium oxide cathode lithium **battery** manuf
IT **Batteries**, secondary
(manufacture of thin-film lithium **batteries**)
IT 12057-17-9, Lithium manganese oxide (LiMn2O4)
RL: DEV (Device component use); USES (Uses)
(amorphous and crystalline; manufacture of thin-film lithium **batteries** with cathode of)
IT 1314-62-1, Vanadium oxide (V2O5), uses
RL: DEV (Device component use); USES (Uses)
(manufacture of thin-film lithium **batteries** with cathode of)
IT 150499-38-0, Lithium metaphosphate nitride oxide (Li3.1(PO3)N0.16O0.8)
150499-39-1, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
150499-40-4, Lithium metaphosphate nitride oxide (Li3.3(PO3)N0.22O0.8)
150926-89-9, Lithium metaphosphate oxide Li2.7(PO3)O0.9
179679-48-2, Lithium oxide phosphate silicate (Li3.6O0.2(PO4)0.81(SiO4)0.19)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(manufacture of thin-film lithium **batteries** with ceramic **electrolyte** of)
IT **179679-48-2**, Lithium oxide phosphate silicate (Li3.6O0.2(PO4)0.81(SiO4)0.19)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(manufacture of thin-film lithium **batteries** with ceramic **electrolyte** of)
RN 179679-48-2 HCAPLUS
CN Lithium oxide phosphate silicate (Li3.6O0.2(PO4)0.81(SiO4)0.19) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.2	17778-80-2
O4Si	0.19	17181-37-2
O4P	0.81	14265-44-2
Li	3.6	7439-93-2

L21 ANSWER 23 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1995:820825 HCAPLUS
DN 123:233358
TI Secondary alkali metal **battery** and its electrolyte
IN Coetzer, Johan
PA Lilliwyte S. A., Luxembourg
SO S. African, 30 pp.
CODEN: SFXXAB
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	ZA 9201893	A	19930913	ZA 1992-1893	19920313
PRAI	ZA 1991-1900	A	19910314		

AB The **battery** has an alkali metal anode, a transition metal halide cathode, and ≥1 liquid electrolyte MxARpXq, where M is an alkali metal or a mixture of these metals; A is selected from Al, B, and/or Zn; R is an organic radical or a mixture of these radicals; X is selected from organic radicals and/or halogens; x is ≥1; p is ≥ 1; q is ≤3; and p + q is ≥4 when A is selected from Al and/or B, and ≥3 when A is selected from Zn and mixts. comprising Zn.
IC ICM H01M
ICS C23F
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST alkali metal **battery** electrolyte
IT **Battery** electrolytes
(alkali metal haloalkylaluminates and/or borates)
IT 12005-14-0, Aluminum lithium oxide (Al5LiO8) 12005-16-2, Aluminum sodium oxide (Al5NaO8) 12005-48-0, Aluminum sodium oxide (Al11NaO17) 12505-59-8, Aluminum lithium oxide (Al11LiO17) 58572-20-6, Sodium zirconium phosphate silicate (Na3Zr2(PO4)(SiO4)2) **81295-89-8**, Lithium zirconium phosphate silicate (Li3Zr2(PO4)(SiO4)2)
RL: DEV (Device component use); USES (Uses)
(alkali metal **battery** separator)
IT 2397-68-4, Sodium tetraethyl aluminate 2666-13-9, Lithium tetraethyl aluminate 14568-29-7 15003-13-1, Lithium tetraethyl borate 15363-51-6, Sodium tetrabutyl aluminate 15523-24-7, Sodium tetraethyl borate 17979-83-8, Sodium tetrabutyl borate 168277-77-8 168475-28-3
RL: DEV (Device component use); USES (Uses)
(**battery** electrolyte)
IT **81295-89-8**, Lithium zirconium phosphate silicate (Li3Zr2(PO4)(SiO4)2)
RL: DEV (Device component use); USES (Uses)
(alkali metal **battery** separator)
RN 81295-89-8 HCAPLUS
CN Lithium zirconium phosphate silicate (Li3Zr2(PO4)(SiO4)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	2	17181-37-2
O4P	1	14265-44-2
Zr	2	7440-67-7
Li	3	7439-93-2

L21 ANSWER 24 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1995:220877 HCAPLUS
DN 122:35184
TI Secondary lithium **batteries**
IN Tanaka, Hidetoshi; Yamamoto, Kohei; Hino, Yoshihisa; Harada, Yoshiro; Nagura, Hideaki
PA Fuji Electrochemical Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06251764	A2	19940909	JP 1993-31722	19930222
PRAI	JP 1993-31722		19930222		

AB The **batteries** comprise stacks of Li-metal oxide cathodes, separators, Li-intercalatable C anodes, nonaq. electrolytes, and ion-conductive thin films, that are independent on the electrode reactions, formed on the anode and cathode surfaces. The thin layers may be formed by radiofrequency sputtering. The **batteries** have a high cycle life.
IC ICM H01M004-02
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium **battery** electrode coating; ion conductor coating **battery** electrode
IT Electrodes
(**battery**, ion-conducting layer-coated lithium)
IT Coke
RL: DEV (Device component use); USES (Uses)
(pitch, anode; lithiated **battery** anodes with ion-conducting coating)
IT 12031-65-1, Lithium nickel oxide (LiNiO2) 12057-17-9, Lithium manganese oxide (limn2o4) 12190-79-3
RL: DEV (Device component use); USES (Uses)
(**battery** cathodes with ion-conducting coating)
IT **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
120479-61-0, Aluminum lithium titanium phosphate (Al0.3Li1.3Ti1.7(PO4)3)
135544-19-3, Aluminum lithium zirconium phosphate (Al0.3Li1.3Zr1.9(PO4)3)
RL: TEM (Technical or engineered material use); USES (Uses)
(**battery** cathodes with ion-conducting coating of)
IT **101993-97-9**, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: TEM (Technical or engineered material use); USES (Uses)
(**battery** cathodes with ion-conducting coating of)
RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

L21 ANSWER 25 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:659663 HCAPLUS
DN 121:259663
TI Secondary nonaqueous-electrolyte **battery** and its manufacture
IN Iwasaki, Fumiharu; Yahagi, Seiji; Sakata, Akifumi; Chinone, Kazuo;

Ishikawa, Hideki; Sakai, Tsugio; Tahara, Kensuke
PA Seiko Instruments Inc., Japan; Seiko Electronic Components Ltd.
SO Eur. Pat. Appl., 22 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 615296	A1	19940914	EP 1994-301699	19940310
	EP 615296	B1	19980128		
	R: DE, FR, GB				
	JP 07230800	A2	19950829	JP 1994-6023	19940124
	JP 3010226	B2	20000221		
	JP 2000077075	A2	20000314	JP 1999-270950	19940124
	JP 2000082459	A2	20000321	JP 1999-270949	19940124
	US 5506075	A	19960409	US 1994-205948	19940303
PRAI	JP 1993-49716	A	19930310		
	JP 1993-80944	A	19930407		
	JP 1993-83682	A	19930409		
	JP 1993-328379	A	19931224		
	JP 1994-6023	A	19940124		

AB The **battery** comprises ≥1 anode, a cathode, and a nonaq. electrolyte with Li ion conductivity, wherein a composite oxide LixSi1-yMyOz is used as an active material of the anode, where M represents ≥1 oxide-forming element other than alkali metals and Si (e.g., Ti, W, Mn, Fe, Ni, B, Sn, or Pb) $0 < x$, $0 < y < 1$, and $0 < z < 2$. The **battery** has an enhanced high current charge and discharge characteristic with a high voltage and high energy d. but with less deterioration due to overcharge and overdischarge, and also has a long service life.
IC ICM H01M004-48
ICS H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium nonaq electrolyte **battery** anode; titanium silicon oxide **battery** anode; tungsten silicon oxide **battery** anode; manganese silicon oxide **battery** anode; iron silicon oxide **battery** anode; nickel silicon oxide **battery** anode; boron silicon oxide **battery** anode; tin silicon oxide **battery** anode; lead silicon oxide **battery** anode
IT **Batteries**, secondary
(nonaq.-electrolyte lithium)
IT Anodes
(**battery**, complex lithium oxides for)
IT 39302-36-8, Lithium silicon titanium oxide **158710-01-1**, Lithium silicon tungsten oxide (Li0-1Si0.9W0.1O1.1) 158710-02-2, Lithium silicon tin oxide (Li0-1Si0-1Sn0-1O2) 158710-03-3, Lead lithium silicon oxide (Pb0-1Li0-1Si0-1O2) 158710-04-4, Lithium silicon borate oxide (Li0-1Si0.25-1(BO2)0-0.75O1.62-2) 158710-05-5, Lithium manganese silicon oxide (Li0-1Mn0-0.75Si0.25-1O2)
RL: DEV (Device component use); USES (Uses)
(anodes for lithium nonaq.-**electrolyte batteries**)
IT 158697-57-5, Silicon tungsten oxide (Si0.9W0.1O1.1) 158697-58-6, Silicon tin oxide (Si0.9Sn0.1O) 158697-59-7, Lead silicon oxide (Pb0.1Si0.9O) 158697-60-0, Silicon borate oxide (Si0.9(BO3)0.1O0.75) 158697-61-1, Manganese silicon oxide (Mn0.5Si0.5O) 158697-62-2, Silicon titanium oxide (Si0.75Ti0.25O) 158697-63-3, Silicon titanium oxide (Si0.5Ti0.5O) 158697-64-4, Silicon titanium oxide (Si0.25Ti0.75O)
RL: DEV (Device component use); USES (Uses)
(anodes for lithium nonaq.-electrolyte **batteries** from lithiated)

IT 158710-01-1, Lithium silicon tungsten oxide (Li0-1Si0.9W0.1O1.1)
RL: DEV (Device component use); USES (Uses)
(anodes for lithium nonaq.-electrolyte batteries)
RN 158710-01-1 HCAPLUS
CN Lithium silicon tungsten oxide (Li0-1Si0.9W0.1O1.1) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	1.1	17778-80-2
W	0.1	7440-33-7
Si	0.9	7440-21-3
Li	0 - 1	7439-93-2

L21 ANSWER 26 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:608163 HCAPLUS
DN 121:208163
TI Carbon dioxide sensors
IN Nakagawa, Takahiro
PA Nippon Ceramic Kk, Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 06160347	A2	19940607	JP 1992-131942	19920423
PRAI	JP 1992-131942		19920423		

AB The sensors comprise alkali or alkaline earth ion-conducting electrolytes (solid electrolytes), metal carbonate sensor electrodes, which show dissociative equilibrium with CO_2, reference electrodes, and heaters, where the electrolytes are installed on the heaters as thin or thick films. The sensors may be laminates comprising the heaters, the reference electrodes, the electrolytes, and the sensor electrodes. The reference electrodes and the sensor electrodes may be installed on the electrolytes intermeshed like combs. Similarly, the electrolytes may be installed between the reference electrodes and sensor electrodes.
IC ICM G01N027-416
ICS G01N027-406
CC 47-8 (Apparatus and Plant Equipment)
ST carbon dioxide sensor solid electrolyte
IT Sensors
(gas, electrochem., solid-state, for carbon dioxide, laminating construction for, for temperature stabilization)
IT 554-13-2, Lithium carbonate
RL: USES (Uses)
(anode, solid-electrolyte carbon dioxide gas sensors containing, laminating construction for, for temperature stabilization)
IT 101993-97-9, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: USES (Uses)
(electrolytes, carbon dioxide gas sensors containing, laminating construction for, for temperature stabilization)
IT 124-38-9, Carbon dioxide, uses
RL: USES (Uses)
(sensors for, solid-electrolyte, laminating construction for, for temperature stabilization)
IT 101993-97-9, Lithium phosphate silicate (Li18(PO4)2(SiO4)3)
RL: USES (Uses)

(**electrolytes**, carbon dioxide gas sensors containing, laminating construction for, for temperature stabilization)
RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

L21 ANSWER 27 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:275398 HCAPLUS
DN 120:275398
TI Thermal **battery** with solid electrolyte
IN Plichta, Edward J.; Behl, Wishvender K.
PA United States Dept. of the Army, USA
SO U.S., 6 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5278004	A	19940111	US 1993-28851	19930310
PRAI	US 1993-28851		19930310		

AB The **battery** electrolyte is a solid solution of Li4GeO4-Li3VO4, Li3.75Si0.75P0.25O4, Li3.4Si0.7S0.3O4, Li2.25C0.75B6.25Ge3, or Li14ZnGe4O1.6.
IC ICM H01M010-39
INCL 429191000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
ST thermal **battery** solid electrolyte; lithium germanium vanadium oxide electrolyte; zinc germanium lithium oxide electrolyte
IT **Battery** electrolytes
(lithium germanium vanadium oxide, thermal)
IT 12192-58-4, Graphite lithium (C6Li) 12798-95-7, Aluminum, lithium 57014-85-4, Lithium vanadium selenide (Li2VSe2) 65777-94-8, Boron, lithium 68848-64-6, Lithium, silicon 70525-13-2, Lithium titanium sulfide (Li2TiS2)
RL: USES (Uses)
(anodes, in thermal **batteries**)
IT 1317-33-5, Molybdenum disulfide, uses 7447-39-4, Copper dichloride, uses 7758-89-6, Copper monochloride 7775-41-9, Silver fluoride 7789-19-7, Copper difluoride 12013-10-4, Cobalt disulfide 12031-65-1, Lithium nickel oxide (LiNiO2) 12033-29-3, Molybdenum trisulfide 12034-78-5, Niobium triselenide 12035-51-7, Nickel disulfide 12037-42-2, Vanadium oxide (V6O13) 12039-13-3, Titanium disulfide 12068-85-8, Iron disulfide 12138-17-9, Vanadium sulfide (V2S5) 12158-49-5, Chromium oxide (Cr3O8) 12162-79-7, Lithium manganese oxide (LiMnO2) 12166-28-8, Vanadium disulfide 12190-79-3, Cobalt lithium oxide (CoLiO2)
RL: USES (Uses)
(cathodes, in thermal **batteries**)
IT 70780-99-3, Germanium lithium zinc oxide (Ge4Li14ZnO16)
154773-82-7, Lithium phosphate silicate
(Li3.75(PO4)0.25(SiO4)0.75) 154773-83-8, Lithium silicate sulfate
(Li3.4(SiO4)0.7(SO4)0.3) 154773-84-9, Germanium lithium boride carbide

(Ge3Li2.25B6.25C0.75) 154838-44-5, Lithium germanium vanadium oxide
(Li3-4(Ge,V)O4)
RL: USES (Uses)
(**electrolytes**, in thermal **batteries**)
IT **154773-82-7**, Lithium phosphate silicate
(Li3.75(PO4)0.25(SiO4)0.75)
RL: USES (Uses)
(**electrolytes**, in thermal **batteries**)
RN 154773-82-7 HCAPLUS
CN Lithium phosphate silicate (Li3.75(PO4)0.25(SiO4)0.75) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.75	17181-37-2
O4P	0.25	14265-44-2
Li	3.75	7439-93-2

L21 ANSWER 28 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1993:629988 HCAPLUS
DN 119:229988
TI Fabrication and characterization of amorphous lithium electrolyte thin films and rechargeable thin-film **batteries**
AU Bates, J. B.; Dudney, N. J.; Gruzalski, G. R.; Zuhr, R. A.; Choudhury, A.; Luck, C. F.; Robertson, J. D.
CS Oak Ridge Natl. Lab., Oak Ridge, TN, 37830, USA
SO Journal of Power Sources (1993), 43(1-3), 103-10
CODEN: JPSODZ; ISSN: 0378-7753
DT Journal
LA English
AB Amorphous Li oxide and oxynitride thin films were synthesized by radio-frequency magnetron sputtering of Li silicates and Li phosphates in Ar, Ar + O, Ar + N, or N. The composition, structure, and elec. properties of the films were determined using ion and electron beam, x-ray, optical, photoelectron, and a.c. impedance techniques. For Li phosphosilicate films, ion conductivity ≤1.4 + 10-6 S/cm at 25° was observed, but none of the films were stable in contact with Li. A thin-film Li P oxynitride electrolyte prepared by sputtering Li3PO4 in pure N had conductivity of 2 + 10-6 S/cm at 25° and excellent long-term stability in contact with Li. Thin-film cells of 1-μm-thick amorphous V2O5 cathode, 1-μm-thick oxynitride electrolyte film, and 5-μm-thick Li anode were cycled between 3.7 and 1.5 V at discharge rate of ≤100 μA/cm2 and charge rate of ≤20 μA/cm2. The open-circuit voltage of 3.6-3.7 V of fully-charged cells remained virtually unchanged after months of storage.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 72
ST lithium vanadium oxide **battery** electrolyte; phosphorus lithium oxynitride electrolyte **battery**
IT **Battery** electrolytes
(lithium phosphorus oxynitrides and lithium oxides, thin-film sputtered, conductivity and stability of)
IT **Batteries**, secondary
(lithium/vanadium pentoxide, thin-film, performance of)
IT Electric conductivity and conduction
(of sputtered lithium phosphorus oxynitrides and lithium oxides)
IT Sputtering
(radio-frequency, of lithium phosphorus oxynitrides and lithium oxides,

for **battery** electrolytes)
IT 7439-93-2, Lithium, uses
RL: USES (Uses)
(anodes, stability of lithium phosphorus oxynitride electrolyte in contact with, in **batteries**)
IT 1314-62-1, Vanadium oxide (V2O5), uses
RL: USES (Uses)
(cathodes, stability of lithium phosphorus oxynitride electrolyte in contact with, in **batteries**)
IT 150499-38-0, Lithium metaphosphate nitride oxide (Li3.1(PO3)N0.16O0.8)
150499-39-1, Lithium metaphosphate nitride oxide (Li2.9(PO3)N0.46O0.3)
150499-40-4, Lithium metaphosphate nitride oxide (Li3.3(PO3)N0.22O0.8)
150499-42-6, Lithium oxide phosphate silicate
(Li3.6O0.16(PO4)0.82(SiO4)0.19) 150926-89-9, Lithium metaphosphate oxide
(Li2.7(PO3)O0.9)
RL: USES (Uses)
(elec. conductivity and stability of thin-film, for **electrolytes**, for lithium **batteries**)
IT **150499-42-6**, Lithium oxide phosphate silicate
(Li3.6O0.16(PO4)0.82(SiO4)0.19)
RL: USES (Uses)
(elec. conductivity and stability of thin-film, for **electrolytes**, for lithium **batteries**)
RN 150499-42-6 HCAPLUS
CN Lithium oxide phosphate silicate (Li3.6O0.16(PO4)0.82(SiO4)0.19) (9CI)
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	0.16	17778-80-2
O4Si	0.19	17181-37-2
O4P	0.82	14265-44-2
Li	3.6	7439-93-2

L21 ANSWER 29 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1992:623861 HCAPLUS
DN 117:223861
TI Substitution effect of framework constituents on electrical property of solid electrolytes with β-Fe2(SO4)3-type structure, M1+XZr2P3-XSiXO12 (M = Li, 1/2Mg, and 1/2Zn)
AU Nomura, Katsuhiro; Ikeda, Shoichiro; Ito, Kaname; Einaga, Hisahiko
CS Fac. Eng., Nagoya Inst. Technol., Nagoya, 466, Japan
SO Chemistry Letters (1992), (10), 1897-900
CODEN: CMLTAG; ISSN: 0366-7022
DT Journal
LA English
AB An enhancement of elec. conductivity was observed by substitution of Si4+ for P5+ in LiZr2(PO4)3, MgZr4(PO4)6, and ZnZr4(PO4)6 solid electrolytes with a β-Fe2(SO4)3-type structure. An increase in the concentration of interstitial Li+ ion resulted in the conductivity enhancement for the Li compound, whereas an increase in the compactness of sintered specimen for the Mg and Zn compds.
CC 76-2 (Electric Phenomena)
ST cond solid electrolyte silicon substitution; lithium zirconium silicon phosphate cond; magnesium silicon zirconium phosphate cond; zinc zirconium phosphate silicate cond
IT Electric conductivity and conduction
(of solid-electrolytes phosphates, silicon substitution effect on)

IT 67972-93-4 **144390-73-8**, Lithium zirconium phosphate silicate (Li1.1Zr2(PO4)2.9(SiO4)0.1) **144390-74-9**, Lithium zirconium phosphate silicate (Li1.2Zr2(PO4)2.8(SiO4)0.2) **144390-75-0**, Lithium zirconium phosphate silicate (Li1.3Zr2(PO4)2.7(SiO4)0.3) **144390-76-1**, Lithium zirconium phosphate silicate (Li1.4Zr2(PO4)2.6(SiO4)0.4) **144390-77-2**, Lithium zirconium phosphate silicate (Li1.5Zr2(PO4)2.5(SiO4)0.5) 144390-78-3, Magnesium zirconium phosphate silicate (Mg1.05Zr4(PO4)5.9(SiO4)0.1) 144390-79-4, Magnesium zirconium phosphate silicate (Mg1.1Zr4(PO4)5.8(SiO4)0.2) 144390-80-7, Magnesium zirconium phosphate silicate (Mg1.15Zr4(PO4)5.7(SiO4)0.3) 144390-81-8, Magnesium zirconium phosphate silicate (Mg1.2Zr4(PO4)5.6(SiO4)0.4) 144390-82-9, Magnesium zirconium phosphate silicate (Mg1.25Zr4(PO4)5.5(SiO4)0.5) 144390-83-0, Zinc zirconium phosphate silicate (Zn1.05Zr4(PO4)5.9(SiO4)0.1) 144390-84-1, Zinc zirconium phosphate silicate (Zn1.1Zr4(PO4)5.8(SiO4)0.2) 144390-85-2, Zinc zirconium phosphate silicate (Zn1.15Zr4(PO4)5.7(SiO4)0.3) 144390-86-3, Zinc zirconium phosphate silicate (Zn1.2Zr4(PO4)5.6(SiO4)0.4) 144390-87-4, Zinc zirconium phosphate silicate (Zn1.25Zr4(PO4)5.5(SiO4)0.5)
RL: USES (Uses)
(elec. conductivity of solid **electrolyte** of)

IT 62585-92-6
RL: USES (Uses)
(elec. conductivity of solid electrolyte of, effect of silicon substitution on)

IT 19527-80-1
RL: TEM (Technical or engineered material use); USES (Uses)
(elec. conductivity of solid electrolyte, effect of silicon substitution in)

IT 7440-21-3, Silicon, properties
RL: PRP (Properties)
(elec. conductivity of solid-electrolyte phosphates affected by substitution with)

IT **144390-73-8**, Lithium zirconium phosphate silicate (Li1.1Zr2(PO4)2.9(SiO4)0.1) **144390-74-9**, Lithium zirconium phosphate silicate (Li1.2Zr2(PO4)2.8(SiO4)0.2) **144390-75-0**, Lithium zirconium phosphate silicate (Li1.3Zr2(PO4)2.7(SiO4)0.3) **144390-76-1**, Lithium zirconium phosphate silicate (Li1.4Zr2(PO4)2.6(SiO4)0.4) **144390-77-2**, Lithium zirconium phosphate silicate (Li1.5Zr2(PO4)2.5(SiO4)0.5)
RL: USES (Uses)
(elec. conductivity of solid **electrolyte** of)

RN 144390-73-8 HCAPLUS
CN Lithium zirconium phosphate silicate (Li1.1Zr2(PO4)2.9(SiO4)0.1) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.1	17181-37-2
O4P	2.9	14265-44-2
Zr	2	7440-67-7
Li	1.1	7439-93-2

RN 144390-74-9 HCAPLUS
CN Lithium zirconium phosphate silicate (Li1.2Zr2(PO4)2.8(SiO4)0.2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

O4Si	0.2	17181-37-2
O4P	2.8	14265-44-2
Zr	2	7440-67-7
Li	1.2	7439-93-2

RN 144390-75-0 HCAPLUS
CN Lithium zirconium phosphate silicate (Li1.3Zr2(PO4)2.7(SiO4)0.3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.3	17181-37-2
O4P	2.7	14265-44-2
Zr	2	7440-67-7
Li	1.3	7439-93-2

RN 144390-76-1 HCAPLUS
CN Lithium zirconium phosphate silicate (Li1.4Zr2(PO4)2.6(SiO4)0.4) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.4	17181-37-2
O4P	2.6	14265-44-2
Zr	2	7440-67-7
Li	1.4	7439-93-2

RN 144390-77-2 HCAPLUS
CN Lithium zirconium phosphate silicate (Li1.5Zr2(PO4)2.5(SiO4)0.5) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	0.5	17181-37-2
O4P	2.5	14265-44-2
Zr	2	7440-67-7
Li	1.5	7439-93-2

L21 ANSWER 30 OF 33 HCAPLUS
AN 1989:466661 HCAPLUS
DN 111:66661
TI Synthesis using solid electrolyte
IN Yokoyama, Seiichiro
PA Idemitsu Kosan Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 01042589	A2	19890214	JP 1987-196267	19870807
PRAI	JP 1987-196267		19870807		

AB The title method involves applying a potential to an electrode catalyst comprising an electrode and metal-ion-conductive solid electrolyte, and contacting a raw material (in vapor phase) to the electrode catalyst.

Thus, an electrode of K2O.11Al2O3 was used for forming paraformaldehyde from MeOH.
IC ICM C25B003-02
CC 72-9 (Electrochemistry)
Section cross-reference(s): 23, 51
ST solid electrolyte catalyst electrode synthesis
IT Electrolysis catalysts
(solid electrolytes)
IT Electrolytes
(solid, electrolysis catalysts)
IT 64-17-5, Ethanol, uses and miscellaneous 67-56-1, Methanol, uses and miscellaneous 67-63-0, Isopropanol, uses and miscellaneous 74-85-1, Ethylene, uses and miscellaneous 110-63-4, 1,4-Butanediol, uses and miscellaneous 115-07-1, Propylene, uses and miscellaneous
RL: RCT (Reactant); RACT (Reactant or reagent)
(electrolysis of, solid electrolyte electrode catalysts for)
IT 75-07-0P, Acetaldehyde, preparation 110-83-8P, Cyclohexene, preparation 592-41-6P, 1-Hexene, preparation 592-43-8P, 2-Hexene 592-47-2P, 3-Hexene 625-27-4P, 2-Methyl-2-pentene 691-37-2P, 4-Methyl-1-pentene 760-20-3P, 3-Methyl-1-pentene 763-29-1P, 2-Methyl-1-pentene 922-61-2P, 3-Methyl-2-pentene 4461-48-7P, 4-Methyl-2-pentene 30525-89-4P, Paraformaldehyde
RL: PREP (Preparation)
(preparation of, electrochem., solid-electrolyte electrode catalyst for)
IT 12005-47-9 12267-44-6 58572-20-6 71211-68-2 80892-16-6 **81295-89-8**
RL: PRP (Properties)
(solid **electrolytes**, as electrode catalyst for electrolysis)
IT **81295-89-8**
RL: PRP (Properties)
(solid **electrolytes**, as electrode catalyst for electrolysis)
RN 81295-89-8 HCAPLUS
CN Lithium zirconium phosphate silicate (Li3Zr2(PO4)(SiO4)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	2	17181-37-2
O4P	1	14265-44-2
Zr	2	7440-67-7
Li	3	7439-93-2

L21 ANSWER 31 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1986:195355 HCAPLUS
DN 104:195355
TI Electrochemical behavior of amorphous thin films of sputtered vanadium pentoxide-tungsten trioxide mixed conductors
AU Kirino, Fumiyoshi; Ito, Yukio; Miyauchi, Katsuki; Kudo, Tetsuichi
CS Cent. Res. Lab., Hitachi Ltd., Kokubunji, 185, Japan
SO Nippon Kagaku Kaishi (1986), (3), 445-50
CODEN: NKAKB8; ISSN: 0369-4577
DT Journal
LA Japanese
AB Thin films of the V2O5-WO3 system with various compns. were prepared by a reactive sputtering technique in H-Ar plasma. All the films obtained were amorphous and exhibited mixed ionic and electronic conduction. The chemical diffusion coefficient .hivin.D of Li in these films increased with increasing WO3 content, W/(W & V), ≤0.63. Its value in the range between 0.63

and 1 of the W content was almost constant, .apprx.10-15 m2/s (25°), while .hivin.D for a pure V2O5 films was 10-17 m2/s. The charge-discharge characteristics of these thin film cathodes were investigated using a solid state Li cell with Li3.6Si0.6P0.4O4 solid electrolyte. On the composition investigated, the capacity loss during cycles was min. for a WO3 thin film. The 55% of its initial capacity was lost in the first 100th cycles, but no more loss was observed up to the 400th cycles after that.

CC 72-3 (Electrochemistry)
Section cross-reference(s): 65, 75

ST lithium **battery** sputtered cathode film; vanadium tungsten oxide sputtered film; diffusion lithium vanadium tungsten oxide

IT **Batteries**, secondary
(lithium-vanadium tungsten oxide amorphous sputtered films with lithium phosphate silicate solid-state electrolyte)

IT Cathodes
(**battery**, lithium oxide-tungsten oxide sputtered films)

IT Sputtering
(reactive, of vanadium oxide-tungsten oxide for cathode films)

IT 1314-62-1, uses and miscellaneous
RL: USES (Uses)
(cathode from sputtered films of tungsten oxide and, for lithium **battery** with lithium phosphate silicate electrolyte)

IT 1314-35-8, uses and miscellaneous
RL: USES (Uses)
(cathodes from films of vanadium oxide and, for lithium **battery** with lithium phosphate silicate electrolyte)

IT 7439-93-2, properties
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(diffusion of, in lithium oxide-tungsten oxide sputtered films)

IT **101993-97-9**
RL: PRP (Properties)
(**electrolyte**, in lithium **battery** with sputtered vanadium oxide-tungsten oxide cathode)

IT 11126-15-1 37349-20-5
RL: PRP (Properties)
(lithium diffusion in amorphous)

IT **101993-97-9**
RL: PRP (Properties)
(**electrolyte**, in lithium **battery** with sputtered vanadium oxide-tungsten oxide cathode)

RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

L21 ANSWER 32 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1986:195353 HCAPLUS
DN 104:195353
TI Titanium disulfide films fabricated by plasma CVD
AU Kanehori, Keiichi; Ito, Yukio; Kirino, Fumiyoshi; Miyauchi, Katsuki; Kudo, Tetsuichi
CS Cent. Res. Lab. Hitachi, Ltd., Tokyo, 185, Japan
SO Solid State Ionics (1986), 18-19(2), 818-22
CODEN: SSIOD3; ISSN: 0167-2738

DT Journal
LA English
AB TiS2 films were fabricated by plasma-enhanced chemical-vapor deposition (CVD) using TiCl4 and H2S as source gases. The films have a nearly stoichiometric composition and preferred orientation whereby the c-axis is parallel to the substrate plane. The chemical diffusion coefficient of Li in Ti1.02S2 film is 10-11-10-9 cm2/s depending on the Li concentration The activation energy of diffusion is 3-60 kJ/mol. In addition, the secondary **battery** performance of film solid-state cell, Li/Li3.6Si0.6P0.4O4/TiS2 was studied.
CC 72-3 (Electrochemistry)
Section cross-reference(s): 75, 78
ST titanium sulfide film prepn cathode; cathode **battery** titanium sulfide film; **battery** lithium titanium sulfide; diffusion lithium titanium sulfide
IT **Batteries**, secondary
(lithium-titanium sulfide, with lithium phosphate silicate electrolyte)
IT Diffusion
(of lithium in titanium sulfide films)
IT Cathodes
(**battery**, titanium disulfide films prepared by plasma-enhanced chemical vapor deposition)
IT 7439-93-2, uses and miscellaneous
RL: USES (Uses)
(**battery**, solid-state, with titanium disulfide)
IT **101993-97-9**
RL: PRP (Properties)
(**electrolyte**, in lithium solid-state **battery** with titanium disulfide cathode)
IT 12039-13-3P
RL: PREP (Preparation)
(films, preparation by plasma-enhanced chemical vapor deposition and use as cathode in lithium solid-state cell)
IT **101993-97-9**
RL: PRP (Properties)
(**electrolyte**, in lithium solid-state **battery** with titanium disulfide cathode)
RN 101993-97-9 HCAPLUS
CN Lithium phosphate silicate (Li18(PO4)2(SiO4)3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4Si	3	17181-37-2
O4P	2	14265-44-2
Li	18	7439-93-2

L21 ANSWER 33 OF 33 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1982:151389 HCAPLUS
DN 96:151389
TI Lithium anode **battery**
PA Nippon Telegraph and Telephone Public Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

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PI    JP 56162477          A2     19811214    JP 1980-65972          19800520
PRAI  JP 1980-65972        A      19800520
AB    A Li anode battery employs Li3Zr2Si2PO12 or Li14Zn(GeO4)4 as the
      cathode active material and an electrolyte which is stable towards the
      cathode-active material and Li, Li+ being transported to effect an
      electrochem. reaction with the cathode active material.
IC    H01M004-58; H01M004-38; H01M006-16; H01M010-40
CC    72-3 (Electrochemistry)
ST    lithium anode zinc germanate cathode; zirconium lithium phosphate silicate
      cathode; germanate lithium zinc battery cathode
IT    Anodes
         (battery, lithium)
IT    Cathodes
         (battery, lithium zinc germanate and lithium zirconium
         phosphate silicate)
IT    7439-93-2, uses and miscellaneous
      RL: USES (Uses)
         (anodes, battery)
IT    70780-99-3 81295-89-8
      RL: PRP (Properties)
         (cathodes, in lithium batteries)
IT    81295-89-8
      RL: PRP (Properties)
         (cathodes, in lithium batteries)
RN    81295-89-8  HCAPLUS
CN    Lithium zirconium phosphate silicate (Li3Zr2(PO4)(SiO4)2) (9CI)  (CA INDEX
      NAME)
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Component	Ratio	Component Registry Number
O4Si	2	17181-37-2
O4P	1	14265-44-2
Zr	2	7440-67-7
Li	3	7439-93-2

Mixture of starting Materials

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=> => d que
L3          757 SEA FILE=REGISTRY ABB=ON  (LI(L)SI(L)(NB OR TA  OR P OR
                W)(L)O)/ELS
L8          143 SEA FILE=REGISTRY ABB=ON  L3(L)4-5/ELC.SUB
L9          146 SEA FILE=HCAPLUS ABB=ON  L8
L12          17 SEA FILE=REGISTRY ABB=ON  L9 AND 1-10/N
L13         125 SEA FILE=REGISTRY ABB=ON  L9 NOT 1-5/S
L14          88 SEA FILE=REGISTRY ABB=ON  L13 NOT 1/TI,AL,FE
L15         102 SEA FILE=HCAPLUS ABB=ON  L14
L16           4 SEA FILE=HCAPLUS ABB=ON  L12
L17         102 SEA FILE=HCAPLUS ABB=ON  (L15 OR L16)
L18          25 SEA FILE=HCAPLUS ABB=ON  L17(L)ELECTROLYT?
L19          29 SEA FILE=HCAPLUS ABB=ON  L17 AND BATTER?
L20          29 SEA FILE=HCAPLUS ABB=ON  L19 AND BATTER?
L21          33 SEA FILE=HCAPLUS ABB=ON  L18 OR L20
L22           1 SEA FILE=REGISTRY ABB=ON  12057-24-8
L24           3 SEA FILE=REGISTRY ABB=ON  1313-96-8 OR 1314-35-8 OR  1314-61-0

L25           1 SEA FILE=REGISTRY ABB=ON  10377-52-3
L26       29638 SEA FILE=HCAPLUS ABB=ON  L22 OR LI2O OR LITHIUM OXIDE
L32        3012 SEA FILE=HCAPLUS ABB=ON  L26 AND (L24 OR L25 OR NB2O5 OR WO3
                OR TA2O5 OR (TANTALUM OR NIOBIUM OR TUNGSTEN)(W)OXIDE OR
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                LI3PO4 OR LITHIUM PHOSPHATE)
L33          638 SEA FILE=HCAPLUS ABB=ON  L32 AND PROC/RL
L35          196 SEA FILE=HCAPLUS ABB=ON  L32 AND ELECTROLYT?(4A)BATTER?
L36           36 SEA FILE=HCAPLUS ABB=ON  L33 AND L35
L37           14 SEA FILE=HCAPLUS ABB=ON  L36 AND PREP/RL
L39           13 SEA FILE=HCAPLUS ABB=ON  (L37 OR L21) NOT L21
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=> d l39 1-13 bib abs ind hitstr

L39 ANSWER 1 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:833563 HCAPLUS
DN 142:9068
TI All-Solid-State Lithium Secondary Battery Using Oxysulfide Glass
AU Takahara, Hikari; Takeuchi, Tomonari; Tabuchi, Mitsuharu; Kageyama, Hiroyuki; Kobayashi, Yo; Kurisu, Yasuyuki; Kondo, Shigeo; Kanno, Ryoji
CS Green Life Technology, National Institute of Advanced Industrial Science and Technology Midorigaoka, Ikeda, Osaka, 563-8577, Japan
SO Journal of the Electrochemical Society (2004), 151(10), A1539-A1544
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
AB Carbon addition to and carbon coating of LiCoO2 has been attempted to improve the rate performance of all-solid-state battery using oxysulfide glass as the solid electrolyte. The sulfide glass electrolyte was prepared from a precursor mixture of 0.1:0.63:0.36 (wt.ratio) **Li3PO4**-Li2S-SiS2. The discharge capacity decreased with the c.d. (0.064 and 0.32 mA/cm2) for the given acetylene black content (0, 0.25, 2.5, and 5 weight%); the mere addition of acetylene black contributed to decreased rate capability. On the other hand, for LiCoO2 coated with carbon deposited by the spark-plasma sintering method, a higher discharge capacity of >100 mA-h/g was measured, even at a higher c.d. (0.32 mA/cm2). Carbon coating of the active material, rather than the merely mixing or addition of carbon, is effective for improving rate performance in all-solid-state batteries.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST solid **electrolyte** lithium secondary **battery** oxysulfide glass; carbon coating cobalt **lithium oxide** cathode battery; spark plasma sintering carbon coating lithium battery cathode
IT Battery cathodes
(carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)
IT Sulfide glasses
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(oxide sulfide, solid electrolyte; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)
IT **Battery electrolytes**
(solid; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)
IT Coating process
(spark, of carbon; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)
IT 12190-79-3, Cobalt **lithium oxide** (CoLiO2)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material

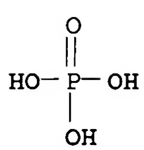
use); **PROC (Process)**; USES (Uses)
(carbon-coated, cathode; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(coating, on battery cathodes; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)

IT **10377-52-3, Lithium phosphate (Li3PO4)** 12136-58-2, Lithium sulfide (Li2S) 13759-10-9, Silicon sulfide (SiS2)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(glass, **battery electrolyte**; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)

IT **10377-52-3, Lithium phosphate (Li3PO4)**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(glass, **battery electrolyte**; carbon-coated cobalt **lithium oxide** (LiCoO2) cathodes in all-solid-state secondary lithium **batteries** with oxysulfide glass **electrolyte**)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



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RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 2 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:625897 HCAPLUS
DN 141:126401
TI Method of preparation of solid electrolyte with high ionic conductivity for battery use
IN Park, Young-Sin; Jin, Young-Gu; Lee, Jong-Heun; Lee, Seok-Soo
PA Samsung Electronics Co., Ltd., S. Korea
SO Eur. Pat. Appl., 15 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1443582	A1	20040804	EP 2004-250404	20040126

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

US 2004151986	A1	20040805	US 2004-757500	20040115
JP 2004235155	A2	20040819	JP 2004-24681	20040130

PRAI KR 2003-6288 A 20030130

AB A solid electrolyte is disclosed including a composition represented by formula: aLi2O-bB2O3-cM-dX, wherein M is at least one selected from the group consisting of TiO2, V2O5, **WO3**, and **Ta2O5**; X is at least one selected from LiCl and Li2SO4; 0.4<a<0.55; 0.4<b<0.55; 0.02<c<0.05; a+b+c = 1, and 0≤d<0.2. A method for preparing the solid **electrolyte** and a **battery** using the solid **electrolyte** are also provided. The solid electrolyte exhibits high ionic conductivity Lithium and thin film **batteries** using the solid **electrolyte** are improved in charge/discharge rate, power output, and cycle life.

IC ICM H01M008-10
ICS H01M006-18

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

ST **battery electrolyte** high ionic cond prepn method

IT Secondary batteries
(lithium; method of preparation of solid electrolyte with high ionic conductivity for battery use)

IT **Battery electrolytes**
Ionic conductivity
(method of preparation of solid electrolyte with high ionic conductivity for battery use)

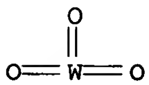
IT Glass, uses
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(method of preparation of solid electrolyte with high ionic conductivity for battery use)

IT 1303-86-2P, Boron oxide (B2O3), uses **1314-35-8P, Tungsten oxide** (**WO3**), uses **1314-61-0P**
, **Tantalum oxide** (**Ta2O5**) 1314-62-1P,
Vanadium oxide (V2O5), uses 7447-41-8P, Lithium chloride (LiCl), uses 10377-48-7P, Lithium sulfate **12057-24-8P, Lithium oxide** (**Li2O**), uses 13463-67-7P, Titania, uses
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(glass; method of preparation of solid electrolyte with high ionic conductivity for battery use)

IT 554-13-2, Lithium carbonate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(precursor; method of preparation of solid electrolyte with high ionic conductivity for battery use)

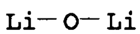
IT **1314-35-8P, Tungsten oxide (WO3)**,
uses **1314-61-0P, Tantalum oxide (**
Ta2O5) 12057-24-8P, Lithium oxide (
Li2O), uses
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(glass; method of preparation of solid electrolyte with high ionic conductivity for battery use)

RN 1314-35-8 HCAPLUS
CN Tungsten oxide (WO3) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



RN 1314-61-0 HCAPLUS
CN Tantalum oxide (Ta2O5) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 12057-24-8 HCAPLUS
CN Lithium oxide (Li2O) (8CI, 9CI) (CA INDEX NAME)

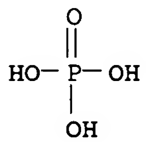


L39 ANSWER 3 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:530045 HCAPLUS
DN 141:74252
TI Laminated film and its manufacture by ion beam sputtering for all solid secondary lithium ion battery
IN Ukaji, Masaya; Higuchi, Hiroshi; Ito, Shuji; Mino, Shinji; Inaba, Junichi
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004183078	A2	20040702	JP 2002-354088	20021205
PRAI	JP 2002-354088		20021205		

AB The claimed laminated film is formed on a substrate by simultaneously irradiating a film material source, a cation, and an anion and then simultaneously irradiating a film material source, a cation, and an electron. The claimed battery is equipped with, on a substrate, a first current collector, a first active mass and a solid electrolyte, a second active mass, and a second current collector, where the solid electrolyte is formed by simultaneously irradiating a film material source, a cation, and an anion and the second active mass is formed by simultaneously irradiating a film material source, a cation, and an electron. Alternatively, the solid electrolyte is formed by simultaneously irradiating a film material source, a cation, and an electron. Alternatively, the second active mass is formed by simultaneously irradiating a film material source, a cation, and an anion. The laminated film, especially suitable for batteries and capacitors, is manufactured by suppressed electrostatic charging.
IC ICM C23C014-48
ICS H01L037-02; H01L041-187; H01L041-24; H01M010-36; H03H003-02; H03H003-08; H01G004-33
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 75
ST ion beam sputtering film lamination solid **electrolyte** lithium **battery**
IT Battery cathodes
Battery electrolytes
Electron beam evaporation
Ion beam sputtering

Laminated materials
(laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT Secondary batteries
(lithium; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 1314-62-1P, Vanadium pentoxide, uses 12190-79-3P, Cobalt **lithium oxide** (CoLiO2)
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); **PREP (Preparation)**; **PROC (Process)**; USES (Uses)
(cathode; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 7439-93-2, Lithium, processes 7440-48-4, Cobalt, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in lithium cobaltate preparation; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 7782-44-7, Oxygen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in lithium cobaltate prepn; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 7727-37-9, Nitrogen, processes **10377-52-3, Lithium phosphate (Li3PO4)**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in **lithium phosphate** nitride preparation; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 7440-62-2, Vanadium, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in vanadium oxide preparation; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT 693781-19-0P, Lithium metaphosphate nitride oxide (Li2.8(PO3)N0.3O0.45)
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); **PREP (Preparation)**; **PROC (Process)**; USES (Uses)
(solid electrolyte; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
IT **10377-52-3, Lithium phosphate (Li3PO4**
)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in **lithium phosphate** nitride preparation; laminated film manufacture by ion beam sputtering with cation and anion for secondary lithium ion battery)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



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L39 ANSWER 4 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:161244 HCAPLUS
DN 140:202430
TI Salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials
IN Armand, Michel; Michot, Christophe; Gauthier, Michel; Choquette, Yves
PA Hydro-Quebec, Can.; Centre National De La Recherche Scientifique (CNRS)
SO Eur. Pat. Appl., 33 pp.
CODEN: EPXXDW
DT Patent
LA French
FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1391952	A2	20040225	EP 2003-292436	19971230
	R: DE, FR, GB, IT				
	CA 2194127	AA	19980630	CA 1996-2194127	19961230
	CA 2199231	AA	19980905	CA 1997-2199231	19970305
	EP 850933	A1	19980701	EP 1997-403188	19971230
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	EP 889863	A2	19990113	EP 1997-951051	19971230
	EP 889863	B1	20030507		
	R: DE, FR, GB, IT				
	EP 890176	A1	19990113	EP 1997-951052	19971230
	EP 890176	B1	20010620		
	R: DE, FR, GB, IT				
	JP 2000508114	T2	20000627	JP 1998-529517	19971230
	JP 2000508346	T2	20000704	JP 1998-529516	19971230
	JP 2000508676	T2	20000711	JP 1998-529514	19971230
	JP 2000508677	T2	20000711	JP 1998-529515	19971230
	JP 2000508678	T2	20000711	JP 1998-529518	19971230
	JP 2002514245	T2	20020514	JP 1998-529513	19971230
	US 6120696	A	20000919	US 1998-125792	19980828
	US 6171522	B1	20010109	US 1998-101811	19981119
	US 6333425	B1	20011225	US 1998-101810	19981119
	US 6228942	B1	20010508	US 1998-125798	19981202
	US 6395367	B1	20020528	US 1998-125799	19981202
	US 6319428	B1	20011120	US 1998-125797	19981203
	US 6365068	B1	20020402	US 2000-609362	20000630
	US 6576159	B1	20030610	US 2000-638793	20000809
	US 2001024749	A1	20010927	US 2001-826941	20010406
	US 6506517	B2	20030114		
	US 2002009650	A1	20020124	US 2001-858439	20010516
	US 2002102380	A1	20020801	US 2002-107742	20020327
	US 6835495	B2	20041228		
	US 2003052310	A1	20030320	US 2002-253035	20020924

	US 2003066988	A1	20030410	US 2002-253970	20020924
	US 2005074668	A1	20050407	US 2004-789453	20040227
	US 2005123831	A1	20050609	US 2004-926283	20040825
PRAI	CA 1996-2194127	A	19961230		
	CA 1997-2199231	A	19970305		
	EP 1997-403188	A3	19971230		
	WO 1997-CA1008	W	19971230		
	WO 1997-CA1009	W	19971230		
	WO 1997-CA1010	W	19971230		
	WO 1997-CA1011	W	19971230		
	WO 1997-CA1012	W	19971230		
	WO 1997-CA1013	W	19971230		
	US 1998-101810	A3	19981119		
	US 1998-101811	A3	19981119		
	US 1998-125798	A3	19981202		
	US 1998-125799	A3	19981202		
	US 1998-125797	A1	19981203		
	US 2000-638793	A1	20000809		
	US 2001-858439	A1	20010516		
	US 2002-107742	A1	20020327		

AB This invention describes ionic compds. where the anionic charge is delocalized. One compound of the invention contains an anionic part associated with at least one mono- or multivalent cationic part Mm+, in a number sufficient to ensure electronic neutrality of the material. M can be a hydronium, nitrosyl NO+, an ammonium NH4+, a metallic cation with valence m, an organic cation having a valence m, or an organometallic cation having valence m. The anionic charge is carried by a new pentacyclic moiety or derivative of tetrapentalene carrying electroattractive substituents. The compds. are used notably for ionic conduction, electronic conductors, dyes and colorants, and catalysts for diverse chemical reactions. They can also be used as **electrolytes** in fuel cells and **batteries.**

IC ICM H01M006-16
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 27, 28, 29, 35, 76

ST pentacyclic tetrapentalene salt charge delocalized anion ionic conduction; alkali alk earth transition metal salt heterocyclic electrolyte polymer; electrochem cell fuel polyelectrolyte cond soly catalysis fluoropolymer polysiloxane

IT Polyoxyalkylenes, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(5-membered ring- containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Spinel-type crystals
(LiyMn1-xMxO2, pos. electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polymerization
(anionic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Solvents
(aprotic, title compds. soluble in; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polymers, uses
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(block, ethylene oxide, propylene oxide, allyl glycidyl ether; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Optical absorption
(by polymer electrolytes; salts of pentacyclic or tetrapentalene

derived anions, and their uses as ionic conductive materials)
IT Carbon black, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(composite electrodes with soft polymer or $LiCoO_2$ and polymer gel electrolytes, or with acetylene black, VO_2 and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Ethers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(cyclic, solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polysiloxanes, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(di-Me, Me hydrogen, a trimethylsilyl-terminated polysiloxane; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Lithiation
(during battery operation; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polyoxyalkylenes, processes
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); **PROC (Process)**
(electrolyte complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Substituent effects
(electronic, electron-withdrawing substituents; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polyoxyalkylenes, uses
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(esters, esters of dicarboxylic acid-substituted 1,2,3-triazole salts; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Heterocyclic compounds
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(five-membered, aromatic, with combinations of N, S, P in ring, anions of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polysiloxanes, uses
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(fluorine-containing, reaction products; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polysiloxanes, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(fluorine-containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Aromatic hydrocarbons, preparation
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(halo, anions containing 5-membered rings; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Hydrocarbons, uses
RL: NUU (Other use, unclassified); USES (Uses)
(halo, solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Cyano group
(ionic compds. containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Phosphates, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(iron, manganese, and lithium -containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Textiles
(laminated, polyelectrolyte composite membrane perfluorinated sulfonylpyrazole-containing polymer; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Heterocyclic compounds
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(nitrogen, five-membered, aromatic, anions of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Open circuit potential
(of dye-sensitized solar cells with imidazolium-triazole-iodide electrolytes; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Ionic conductivity
(of lithium salts in polymer electrolytes and polymer gel electrolytes; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Cyclic voltammetry
(of secondary **battery** cells with polymer gel **electrolytes**; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Polysulfides
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(organic, pos. electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Cations
(organic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Fluorides, uses
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(organic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Azines
Group VA element compounds
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(phosphazines, polymers, "solvents" for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)
IT Heterocyclic compounds
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)

(phosphorus, aromatic, five-membered, anions of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polar solvents
(polymeric; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Vinyl compounds, uses
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(polymers; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polyurethanes, uses
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(polyoxyalkylene-, polyethylene glycol- based, "solvents" for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Fluoropolymers, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(polysiloxane-; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Olivine-group minerals
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(pos. electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Secondary batteries
(salts of pentacyclic or tetrapentalene derived anions for use in; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Aldol condensation catalysts
Antistatic agents
Coloring materials
Corrosion inhibitors
Dyes
Electron delocalization
Esterification
Friedel-Crafts reaction catalysts
Fuel cell separators
Heterojunction solar cells
Ionic liquids
Michael reaction catalysts
Plasticizers
Polyelectrolytes
Polymer electrolytes
Polymerization catalysts
Solubility
Substitution reaction, nucleophilic
Surfactants
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Alkali metal salts
Transition metal salts
RL: DEV (Device component use); PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Fluoropolymers, uses
Polyanilines
Salts, uses
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Quaternary ammonium compounds, uses
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Polysiloxanes, uses
RL: DEV (Device component use); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Alkaline earth salts
Rare earth salts
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Organometallic compounds
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(salts with organometallic cations; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Nitroso compounds
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(salts; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Electric current
(short circuit; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Phosphates, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(silico-, iron, manganese, and lithium -containing; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Fluoropolymers, uses
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(siloxane-, reaction products; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Ethers, uses
RL: DEV (Device component use); NUU (Other use, unclassified); USES (Uses)
(solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Amides, uses
Nitrates, uses
Nitriles, uses
Sulfamides
Sulfones
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for title compds.; salts of pentacyclic or tetrapentalene

derived anions, and their uses as ionic conductive materials)

IT Diels-Alder reaction catalysts
(stereoselective; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Heterocyclic compounds
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(sulfur, aromatic, five-membered, anions of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Aromatic compounds
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(sulfur, heterocyclic, five-membered, anions of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT Cations
(trivalent, metal salts; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 75-21-8D, Ethylene oxide, block polyoxyalkylene copolymers containing
75-56-9D, Propylene oxide, block polyoxyalkylene copolymers containing
106-92-3D, Allylglycidyl ether, block polyoxyalkylene copolymers containing
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
("solvents" for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-43-4P
RL: CAT (Catalyst use); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(Aldol condensation catalyst; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 280-57-9, 1,4-Diazabicyclo[2.2.2]octane
RL: RCT (Reactant); RACT (Reactant or reagent)
(DABCO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-99-1P
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**
(a dye; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661467-43-2P
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**
(an antistatic surfactant; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 12036-21-4, Vanadium dioxide
RL: DEV (Device component use); USES (Uses)
(battery electrode composites with acetylene black and PEO; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-97-9P
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(composite electrodes with $LiCoO_2$ and carbon black; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-60-5DP, polyaniline doped with
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PUR (Purification or recovery); PYP (Physical process); SPN (Synthetic preparation); **PREP (Preparation)**; **PROC (Process)**

(conductor and corrosion inhibitor; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7439-89-6, Iron, properties
RL: PRP (Properties)
(corrosion of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT **1314-35-8**, Tungsten trioxide, uses 202847-01-6, Hydrogen iridium oxide
RL: DEV (Device component use); USES (Uses)
(electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 25322-68-3, Polyethylene oxide
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); **PROC (Process)**
(electrolyte complexes with lithium salts, carbon blacks, (1,2,3-triazolium) ionic liqs., and other materials; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-62-6P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**
(electrolyte, ionic liquid; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210470-02-3P
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**
(electropolymd.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(in electrochem. cells, and corrosion of; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate
RL: PRP (Properties)
(in gel polymer electrolyte; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 107-13-1, Acrylonitrile, reactions
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(in gel polymer electrolyte; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 110-86-1D, Pyridine, anionic derivs.
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(including photosensitizing dyes; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 2923-16-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(made by Parish, see pg. 13; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 13463-67-7, Titanium dioxide, uses
RL: DEV (Device component use); USES (Uses)
(nanoparticles; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7439-93-2D, Lithium, alloys
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(neg. electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-63-8P
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**
(photoinitiator; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-59-1P
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(polyelectrolyte composite membrane with GoreTex and Friedel-Crafts catalyst; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 1317-37-9, Iron sulfide (FeS) 10028-22-5, Iron sulfate (Fe2(SO4)3) 11099-11-9, Vanadium oxide 12068-85-8, Iron disulfide (FeS2) 12423-04-0, Lithium vanadium oxide (LiV3O8) 61179-01-9, Aluminum lithium manganese oxide 131344-56-4, Cobalt lithium nickel oxide 133782-19-1, Lithium manganese vanadium oxide 162684-16-4, Lithium manganese nickel oxide 204450-96-4, Chromium lithium manganese oxide
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(pos. electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-54-7P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**
(pure and polymer electrolytes with polyethylene oxide; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 110-86-1, Pyridine, uses 865-47-4 5264-33-5 7440-50-8, Copper, uses 7440-66-6, Zinc, uses 7664-93-9, Sulfuric acid, uses 16941-12-1, Chloroplatinic acid
RL: CAT (Catalyst use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7580-67-8, Lithium hydride
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7553-56-2, Iodine, uses 141460-19-7, N 3 Dye 178631-05-5
RL: DEV (Device component use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 9003-07-0, Polypropylene
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**; USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 12190-79-3, Cobalt **lithium oxide** (CoLiO2)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-36-4P 661461-40-1P 661461-42-3P 661461-49-0P 661461-50-3P 661461-64-9P 661467-44-3P
RL: DEV (Device component use); PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 13968-08-6DP, Hydronium, salts
RL: DEV (Device component use); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); **PREP (Preparation)**; RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 289-06-5D, Thiadiazole, anionic derivs. 289-95-2D, Pyrimidine, anionic derivs. 290-37-9D, Pyrazine, anionic derivs. 7439-93-2, Lithium, uses 11120-54-0D, Oxadiazole, anionic derivs.
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 124-38-9, Carbon dioxide, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7447-40-7, Potassium chloride, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); REM (Removal or disposal); FORM (Formation, nonpreparative); **PROC (Process)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 554-68-7, Triethylammonium chloride 2624-17-1, Sodium isocyanurate 4128-37-4 7492-68-4, Copper carbonate 7727-37-9, Nitrogen, processes 14075-53-7, Potassium tetrafluoroborate 63872-66-2, 1,4-Diazabicyclo[2.2.2]octane, hydrochloride
RL: FMU (Formation, unclassified); REM (Removal or disposal); FORM (Formation, nonpreparative); **PROC (Process)**
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 56664-66-5
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 123-91-1, Dioxane, uses 7487-88-9, Magnesium sulfate, uses
RL: NUU (Other use, unclassified); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 75-38-7D, Vinylidene difluoride, derivs., polymers of 80-62-6D, Methyl methacrylate, derivs., polymers of 88-12-0D, derivs., polymers of 107-13-1D, Acrylonitrile, derivs., polymers of
RL: NUU (Other use, unclassified); TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-57-9P
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PYP (Physical process); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; **PROC (Process)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210289-51-3P
RL: PRP (Properties); PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 661461-51-4P

RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 67-56-1, Methanol, uses
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210469-91-3P 661461-52-5P
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 210470-01-2P
RL: PUR (Purification or recovery); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 709-62-6P 7343-34-2P, 3,5-Dimethyl-1H-1,2,4-triazole 25979-00-4P 210289-29-5P 210289-38-6P 210289-49-9P 210289-52-4P 210469-88-8P 210469-95-7P 661461-45-6P 661461-57-0P 661461-60-5P
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 100-06-1P, p-Acetylanisole 210289-48-8P 661461-44-5P 661461-53-6P 661461-55-8P 661461-56-9P 661467-37-4P
RL: PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 76-05-1, reactions 78-94-4, Methyl vinyl ketone, reactions 94-41-7 98-88-4, Benzoyl chloride 100-52-7, Benzaldehyde, reactions 100-66-3, Anisole, reactions 102-52-3, 1,1,3,3-Tetramethoxypropane 106-20-7, Di-2-ethylhexylamine 108-24-7, Acetic anhydride 109-72-8, Butyllithium, reactions 110-61-2, Succinic dinitrile 112-76-5, Stearic acid chloride 121-44-8, Triethylamine, reactions 143-33-9, Sodium cyanide 144-55-8, Sodium bicarbonate, reactions 303-04-8, 2,3-Dichloro-Hexafluoro-2-butene 326-90-9, 4,4,4-Trifluoro-1-(2-furyl)-1,3-butanedione 326-91-0 375-72-4, Perfluorobutanesulfonyl fluoride 407-38-5, 2,2,2-Trifluoroethyl trifluoroacetate 421-83-0, Trifluoromethanesulfonyl chloride 497-19-8, Sodium carbonate, reactions 538-75-0, Dicyclohexylcarbodiimide 542-92-7, Cyclopentadiene, reactions 554-13-2, Lithium carbonate 584-08-7, Potassium carbonate 676-58-4, Methylmagnesium chloride 677-25-8, Ethenesulfonyl fluoride 692-50-2 693-13-0, 1,3-Diisopropylcarbodiimide 764-93-2, 1-Decyne 765-12-8, Triethylene glycol divinyl ether 917-70-4, Lanthanum acetate 937-14-4, 3-Chloroperoxybenzoic acid 1000-84-6 1068-57-1, Acetylhydrazide 1122-28-7, 4,5-Dicyanoimidazole 1310-58-3, Potassium hydroxide, reactions 1522-22-1, Hexafluoroacetylacetone 1643-19-2, Tetrabutylammonium bromide 1648-99-3 2094-98-6, 1,1'-Azobis(cyclohexanecarbonitrile) 2582-30-1, 1-Aminoguanidine bicarbonate 2633-67-2, 4-Styrenesulfonyl chloride 2638-94-0, 4,4'-Azobis(4-cyanovaleric acid) 2893-78-9, Dichloroisocyanuric acid, sodium salt 3804-23-7, Scandium acetate 4546-95-6, 1,2,3-Triazole-4,5-dicarboxylic acid 7447-41-8, Lithium chloride, reactions 7647-01-0, Hydrochloric acid, reactions 7647-14-5, Sodium chloride, reactions 7664-39-3, Hydrofluoric acid, reactions 7757-82-6, Sodium sulfate, reactions 7758-09-0, Potassium nitrite 7782-50-5, Chlorine, reactions 7789-23-3,

Potassium fluoride 9002-92-0, Brij 30 13360-57-1 13637-84-8,
Chlorosulfonyl fluoride 13781-67-4, 2-(3-Thienyl)ethanol 14635-75-7,
Nitrosonium tetrafluoroborate 16090-14-5 17455-13-9, 18-Crown-6
17587-22-3, 1,1,1,2,2,3,3-Heptafluoro-7,7-dimethyl-4,6-octanedione
20583-66-8, 1,1,1,5,5,6,6,7,7,7-Decafluoro-2,4-Heptanedione 26628-22-8,
Sodium azide 27070-49-1, 1,2,3-Triazole 31469-15-5,
1-Methoxy-1-(trimethylsilyloxy)-2-methyl-1-propene 39262-22-1
39377-49-6, Copper cyanide 53188-07-1, Trolox 56512-49-3,
4-(Dimethylamino)azobenzene-4'-sulfonyl chloride 65039-09-0,
1-Ethyl-3-methyl-1H-imidazolium chloride 66051-48-7 77968-17-3
81850-46-6 81850-47-7 89183-45-9, Polyaniline hydrochloride
210049-00-6 210289-26-2 210289-55-7 210469-93-5 661461-58-1
661461-61-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 7081-78-9P, 1-Chloro-1-ethoxyethane 14694-34-9P 210289-23-9P
210289-24-0P 210289-27-3P 210289-28-4P 210289-33-1P 210289-34-2P
210289-35-3P 210469-96-8P 210470-00-1P 661461-47-8P 661461-59-2P
661467-33-0P
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 1333-74-0, Hydrogen, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 58649-05-1P 107740-92-1P 159699-92-0P 210289-25-1P 210469-94-6P
661461-39-8P 661461-41-2P 661461-46-7P 661461-48-9P 661465-23-2P
661467-34-1P 661467-35-2P 661467-36-3P 661467-38-5P 661467-39-6DP,
tetraalkylammonium salts
RL: SPN (Synthetic preparation); **PREP (Preparation)**
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 100-42-5D, Styrene, 5-membered ring- containing derivs.
RL: TEM (Technical or engineered material use); USES (Uses)
(salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

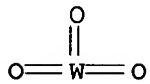
IT 126-33-0D, Sulfolane, derivs.
RL: NUU (Other use, unclassified); USES (Uses)
(solvent for title compds.; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT 156118-35-3DP, 2-(5-cyano-1,3,4-triazole)-4,4-difluorobutyl-, lithium salt
RL: PUR (Purification or recovery); SPN (Synthetic preparation); **PREP (Preparation)**
(surfactant and antistatic; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

IT **1314-35-8**, Tungsten trioxide, uses
RL: DEV (Device component use); USES (Uses)
(electrode; salts of pentacyclic or tetrapentalene derived anions, and their uses as ionic conductive materials)

RN 1314-35-8 HCAPLUS

CN Tungsten oxide (WO3) (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)



L39 ANSWER 5 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:435148 HCAPLUS
DN 138:388239
TI In situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochemical cells
IN Xing, Weibing; Takeuchi, Esther S.
PA USA
SO U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003104282	A1	20030605	US 2001-883	20011115
PRAI	US 2001-883		20011115		

AB A single step, in situ curing method for making gel polymer lithium ion rechargeable cells and batteries is disclosed. This method used a precursor solution consisting of monomers with multiple functionalities such as multiple acryloyl functionalities, a free-radical generating activator, nonaq. solvents such as ethylene carbonate and propylene carbonate, and a lithium salt such as $LiPF_6$. The electrodes are prepared by slurry-coating a carbonaceous material such as graphite onto an anode current collector and a lithium transition metal oxide such as $LiCoO_2$ onto a cathode current collector, resp. The electrodes, together with a highly porous separator, are then soaked with the polymer electrolyte precursor solution and sealed in a cell package under vacuum. The whole cell package is heated to in situ cure the polymer electrolyte precursor. The resulting lithium ion rechargeable cells with gelled polymer electrolyte demonstrate excellent electrochem. properties such as high efficiency in material utilization, high Coulombic efficiency, good rate capability, and good cyclability.
IC ICM H01M010-40
ICS H01M004-58; H01M004-66
INCL 429303000; 429189000; 429231800; 429245000; 429231100; 029623100
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST lithium **battery** gel polymer **electrolyte** in situ thermal polymn
IT **Battery electrolytes**
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)
IT Carbon black, uses
Coke
RL: DEV (Device component use); USES (Uses)
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)
IT Secondary batteries
(lithium; in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)
IT Polymerization
(thermal; in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)
IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum,

uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 11101-13-6 12597-68-1, Stainless steel, uses
RL: DEV (Device component use); USES (Uses)
(anode current collector; in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); USES (Uses)
(glassy; in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT 94-36-0, Benzoyl peroxide, processes 105-74-8, Lauroyl peroxide 2094-98-6, 1,1'-Azobis(cyclohexanecarbonitrile) 2638-94-0, 4,4'-Azobis(4-cyanovaleric acid) 3006-86-8, 1,1-Bis(tert-butylperoxy)cyclohexane 15667-10-4, 1,1-Bis(tert-amylperoxy)cyclohexane
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT 96-48-0, γ-Butyrolactone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 556-65-0, Lithium thiocyanate 685-91-6, n,n-Diethylacetamide 1313-13-9, Manganese dioxide, uses 1313-99-1, Nickel oxide nio, uses 1314-62-1, Vanadia, uses 1317-37-9, Iron sulfide Fes 1332-37-2, Iron oxide, uses 1344-70-3, Copper oxide 2923-17-3 4437-85-8, Butylene carbonate 7782-42-5, Graphite, uses 7784-01-2, Silver chromate 7789-19-7, Copperfluoride cuf2 7791-03-9, Lithium perchlorate 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11105-02-5, Silver vanadium oxide 11113-75-0, Nickel sulfide 11115-76-7, Cobalt selenide 11115-77-8, Cobalt telluride 11115-78-9, Copper sulfide 11115-99-4, Nickel selenide 11116-00-0, Nickel telluride 11118-57-3, Chromium oxide 11126-12-8, Iron sulfide 11129-60-5, Manganese oxide 11130-24-8, Vanadium sulfide 12031-65-1, Lithium nickel oxide LiNiO2 12039-13-3, Titanium sulfide (TiS2) 12057-17-9, Lithium manganese oxide LiMn2O4 **12057-24-8**, Lithia, uses 12068-85-8, Iron sulfide Fes2 12162-79-7, Lithium manganese oxide LiMnO2 12162-92-4, Lithium vanadium oxide LiV2O5 12190-79-3, Cobalt **lithium oxide** CoLiO2 12612-50-9, Molybdenum sulfide 12623-97-1, Chromium sulfide 12627-00-8, **Niobium oxide** 12653-56-4, Cobalt sulfide 12673-92-6, Titanium sulfide 12687-82-0, Manganese sulfide 12789-09-2, Copper vanadium oxide 12795-09-4, Copper telluride 13453-75-3 13463-67-7, Titanium oxide, uses 14024-11-4, Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 20667-12-3, Silver oxide ag2o 21324-40-3, Lithium hexafluorophosphate 22205-45-4, Copper sulfide cu2s 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37320-90-4, Manganese selenide 37359-15-2, Copper selenide 39290-91-0, Niobium sulfide 39361-71-2, Titanium telluride 50808-87-2, Molybdenum telluride 50814-22-7, Chromium telluride 50926-12-0, Iron selenide 50926-13-1, Iron telluride 51311-17-2, Carbon fluoride 54183-54-9, Molybdenum selenide 54427-25-7, Vanadium telluride 58319-81-6, Manganese telluride 64176-75-6, Niobium selenide 66675-50-1, Titanium selenide 66675-60-3, Chromium selenide 90076-65-6 115028-88-1 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 135751-98-3, Vanadium selenide 155645-82-2, Silver oxide ag2o2 162124-03-0, Niobium telluride 181183-66-4, Copper Silver vanadium oxide 188029-35-8, Lithium titanium oxide Li4-7Ti5O12 423734-10-5, Cobalt lithium nitride Co0.1-0.6Li2.4-2.9N 423734-14-9, Lithium nickel nitride Li2.4-2.9Ni0.1-0.6N 527698-30-2, Copper lithium tin oxide (Cu0.92LiSn0.08O2)

RL: DEV (Device component use); USES (Uses)
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT 26426-04-0P, Trimethylolpropane trimethacrylate homopolymer 57592-66-2P, Pentaerythritol tetraacrylate homopolymer 57592-67-3P, Hexanediol diacrylate homopolymer 64401-02-1P, Bisphenol A-ethylene oxide adduct diacrylate 67653-78-5P, Dipentaerythritol hexaacrylate homopolymer 82200-28-0P, Dipentaerythritol pentaacrylate homopolymer 85887-85-0P, Ethoxylated trimethylolpropane triacrylate homopolymer 103315-68-0P, Di(trimethylolpropane)tetraacrylate homopolymer 117223-60-6P
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT **12057-24-8**, Lithia, uses
RL: DEV (Device component use); USES (Uses)
(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

RN 12057-24-8 HCAPLUS

CN Lithium oxide (Li2O) (8CI, 9CI) (CA INDEX NAME)

Li—O—Li

L39 ANSWER 6 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:306576 HCAPLUS

DN 139:182767

TI **Li3PO4**:N/LiCoO2 coatings for thin film batteries

AU Gross, M. E.; Martin, P. M.; Stewart, D. C.; Johnston, J. W.; Windisch, C. F.; Graff, G. L.; Rissmiller, P. L.; Dudeck, E. L.

CS Pacific Northwest National Laboratory, Richland, WA, USA

SO Annual Technical Conference Proceedings - Society of Vacuum Coaters (2002), 45th, 119-124
CODEN: ATCCDI; ISSN: 0731-1699

PB Society of Vacuum Coaters

DT Journal

LA English

AB **Li3PO4**:N (LIPON)/Li1.04CoO2 thin film battery structures were deposited up to 2 μm thick were deposited using a 15.2 cm diameter Li2.9PO3.5 pressed powder target for reactive RF magnetron sputtering. Li1.04CoO2 thin films were deposited using a 15.2 cm diameter LiCoO2 pressed powder target. LIPON films were deposited in an ultra pure N2 atmosphere and LiCoO2 films were deposited in an ultra pure atmospheric of Ar + O2. Total chamber pressure during deposition ranged between 5 and 20 mtorr and RF power to the sputtering targets ranged from 100 W to 450 W. Because XPS gave ambiguous compositional results, the films were optimized for a.c. and d.c. conductivity Elec. conductivity was extremely sensitive to deposition conditions, deposition rate, sputtering gas pressure, and reactive gas partial pressure. AC conductivity measurements were made at a frequency of 10 kHz, and were correlated to d.c. conductivity measurements. LIPON films had the highest conductivities in the 660 nS cm-1 range and the highest a.c. conductivity of Li1.04CoO2 films was .apprx.0.24 S cm-1. Earlier work showed the most conductive films were deposited at 20 mtorr pressures and target powers of 100 W. This work has scaled up to conductive films being deposited at 7.5 mtorr pressures and target powers of 400 W. X-ray diffraction anal. showed that the films were mostly amorphous. Films deposited under these conditions were transparent at visible wavelengths with a refractive index of 1.6. Lower conductivity films were brownish in appearance and had less

transmission than films with high conductivity The rechargeable battery structure consisting of an alumina substrate, gold current collector, 0.5-μm Li1.04CoO2 cathode, 1.2-μm LIPON electrolyte, Li metal anode, and a copper current collector are currently under test. Early thin film battery cycle testing was successful, addnl. testing is on-going. Performance results are correlated with film properties and reported. Future work will involve optimization of battery performance on a large scale and scale up of the deposition process to include flexible web processing.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

ST **Li3PO4** LiCoO2 coating thin film reactive RF magnetron sputtering; XRD secondary lithium **battery electrolyte** electrode cond SEM voltammetry

IT Battery electrodes
Battery electrolytes
Cyclic voltammetry
Electric conductivity
Electric impedance
Secondary batteries
(**Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Ceramics
(coated substrate; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Polyimides, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**; USES (Uses)
(coated substrate; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Glass, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**; USES (Uses)
(gold-coated, coated substrate; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Reactive sputtering
(radio-frequency, magnetron; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Magnetron sputtering
(radio-frequency, reactive; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT Crystal structure
(rhombohedral (LiCoO2 film); **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT 203402-92-0P, Lithium nitride phosphate
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(LIPON, sputtered layer; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT 7727-37-9, Nitrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT 7439-93-2, Lithium, uses 12142-83-5, Tin nitride (Sn3N4)
RL: DEV (Device component use); USES (Uses)
(anode; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)

IT 1344-28-1, Alumina, uses 7440-32-6, Titanium, uses 60676-86-0, Fused silica
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**; USES (Uses)
(coated substrate; **Li3PO4**:N/LiCoO2 coatings for thin film

secondary batteries)
IT 7429-90-5, Aluminum, uses
RL: DEV (Device component use); USES (Uses)
(foil; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
IT 7440-50-8, Copper, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**; USES (Uses)
(gold-coated, coated substrate, and anode; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
IT 12190-79-3, Cobalt **lithium oxide** (CoLiO2)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); **PROC (Process)**
(pressed powder target; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
IT 581094-51-1, Lithium metaphosphate oxide (Li2.9(PO3)O0.5)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PYP (Physical process); **PROC (Process)**
(pressed powder target; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
IT 152829-46-4P, Cobalt **lithium oxide** (CoLi1.04O2)
RL: DEV (Device component use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)
(sputtered layer, cathode; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
IT 7440-57-5, Gold, uses
RL: DEV (Device component use); USES (Uses)
(substrate coating; **Li3PO4**:N/LiCoO2 coatings for thin film secondary batteries)
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 7 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:195192 HCAPLUS
DN 136:328079
TI Fabrication and testing of all solid-state microscale lithium batteries for microspacecraft applications
AU West, W. C.; Whitacre, J. F.; White, V.; Ratnakumar, B. V.
CS Electrochemical Technologies Group/Micro Device Laboratories/Center for Integrated Space Microsystems. Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91109, USA
SO Journal of Micromechanics and Microengineering (2002), 12(1), 58-62
CODEN: JMMIEZ; ISSN: 0960-1317
PB Institute of Physics Publishing
DT Journal
LA English
AB A microfabrication process has been developed to prepare thin film solid-state lithium batteries as small as 50 μm + 50 μm. Individual cells operate nominally at 3.9 V with 10 μA h cm-2 for a 0.25 μm thick cathode film. The cells are easily fabricated in series and parallel arrangement to yield batteries with higher voltage and/or capacity. Multiple charge/discharge cycles are possible, though an apparent reaction of the in situ plated Li film with water or oxygen decreases cycle life several orders of magnitude from expected results. Further optimization of an encapsulating film will likely extend the cell cyclability. These microbattery arrays will be useful for providing on-chip power for low current, high voltage applications for microspacecraft and other miniaturized systems.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 48, 72

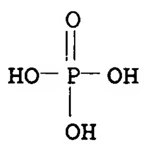
ST solid state microscale lithium batteries microspacecraft applications
fabrication
IT Electric charge
(charge-discharge characteristics of solid-state microscale lithium
batteries for microspacecraft applications)
IT Annealing
(effect of $LiCoO_2$ annealing on elec. capacitance of solid-state
microscale lithium batteries for microspacecraft applications)
IT Solid state secondary batteries
Space vehicles
(fabrication and testing of all solid-state microscale lithium
batteries for microspacecraft applications)
IT Secondary batteries
(lithium; fabrication and testing of all solid-state microscale lithium
batteries for microspacecraft applications)
IT Magnetron sputtering
(of components in fabrication solid-state microscale lithium batteries
for microspacecraft applications)
IT Electric capacitance
(of solid-state microscale lithium batteries for microspacecraft
applications)
IT Photoresists
(use in fabrication solid-state microscale lithium batteries for
microspacecraft applications)
IT 7439-93-2, Lithium, uses
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,
engineering or chemical process); RCT (Reactant); **PROC (Process)**
; RACT (Reactant or reagent); USES (Uses)
(fabrication and testing of all solid-state microscale lithium
batteries for microspacecraft applications)
IT 150499-40-4P, Lithium metaphosphate nitride oxide ($Li_{3.3}(PO_3)N_{0.22}O_{0.8}$)
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,
engineering or chemical process); PNU (Preparation, unclassified);
PREP (Preparation); **PROC (Process)**; USES (Uses)
(formation of solid state **electrolyte** for lithium
batteries for microspacecraft applications by magnetron
sputtering of **Li_3PO_4** in N_2 atmospheric)
IT 12190-79-3, Cobalt **Lithium oxide** $CoLiO_2$
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical,
engineering or chemical process); RCT (Reactant); **PROC (Process)**
; RACT (Reactant or reagent); USES (Uses)
(magnetron sputtering in fabrication solid-state microscale lithium
batteries for microspacecraft applications)
IT 7440-02-0, Nickel, reactions 7440-06-4, Platinum, reactions 7440-32-6,
Titanium, reactions **10377-52-3, Lithium
phosphate**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); **PROC (Process)**; RACT (Reactant or
reagent)
(magnetron sputtering in fabrication solid-state microscale lithium
batteries for microspacecraft applications)
IT 7727-37-9, Nitrogen, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); **PROC (Process)**; RACT (Reactant or
reagent)
(magnetron sputtering of **Li_3PO_4** in N_2 atmospheric in fabrication
solid-state microscale lithium batteries for microspacecraft
applications)
IT 12033-89-5, Silicon nitride, uses
RL: MSC (Miscellaneous); NUU (Other use, unclassified); USES (Uses)

(magnetron sputtering of components on Si substrate with SiN film in fabrication solid-state microscale lithium batteries for microspacecraft applications)

IT 7440-21-3, Silicon, uses
RL: MSC (Miscellaneous); NUU (Other use, unclassified); USES (Uses)
(magnetron sputtering of components on Si substrate with SixNy film in fabrication solid-state microscale lithium batteries for microspacecraft applications)

IT **10377-52-3, Lithium phosphate**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); **PROC (Process)**; RACT (Reactant or reagent)
(magnetron sputtering in fabrication solid-state microscale lithium batteries for microspacecraft applications)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L39 ANSWER 8 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:66767 HCAPLUS
DN 136:105160
TI Method of producing anode for lithium secondary battery
IN Kugai, Hirokazu; Ota, Nobuhiro; Yamanaka, Shozaku
PA Sumitomo Electric Industries, Ltd., Japan
SO Eur. Pat. Appl., 17 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1174934	A2	20020123	EP 2001-306240	20010719
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	JP 2002100346	A2	20020405	JP 2000-382173	20001215
	JP 3412616	B2	20030603		
	CA 2350455	AA	20020119	CA 2001-2350455	20010613
	US 2002036131	A1	20020328	US 2001-884633	20010618
	US 6656233	B2	20031202		
	CN 1333575	A	20020130	CN 2001-123143	20010717
	US 2004109940	A1	20040610	US 2003-725860	20031201
PRAI	JP 2000-219072	A	20000719		
	JP 2000-382173	A	20001215		
	US 2001-884633	A1	20010618		

AB A method of producing a neg. electrode for a lithium secondary cell having thin films of lithium and a sulfide-based inorg. solid electrolyte is

provided. In the method, are used a neg. electrode base material and an inorg. solid electrolyte source material resp. placed in closed containers. The base material has a surface of lithium metal. The base material and the source material are resp. taken out from the closed containers in a chamber space, which is substantially inactive to lithium and which is insulated from air and provided adjacent to a thin film deposition system. The base material and the source material are transferred into the thin film deposition system without being exposed to the air. In system, the source material is used and a thin film of an inorg. solid electrolyte is formed on the base material. The base material having the thin film is transferred, without being exposed to the air, into a chamber space, which is substantially inactive to lithium. In chamber space, the base material having the thin film is placed into a closed container. Thus, a neg. electrode can be produced without being degraded by air.

IC ICM H01M004-02
ICS H01M004-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST anode prepn lithium secondary battery
IT Vapor deposition process
(ion plating; method of producing anode for lithium secondary battery)
IT Secondary batteries
(lithium; method of producing anode for lithium secondary battery)
IT Battery anodes
Battery electrolytes
Laser ablation
Sputtering
Vapor deposition process
(method of producing anode for lithium secondary battery)
IT Lithium alloy, base
RL: DEV (Device component use); USES (Uses)
(method of producing anode for lithium secondary battery)
IT 1314-56-3, Phosphorus pentoxide, processes 12136-58-2, Lithium sulfide 13759-10-9, Silicon disulfide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); **PROC (Process)**
(electrolyte; method of producing anode for lithium secondary battery)
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 7439-93-2, Lithium, uses 12190-79-3, Cobalt **lithium oxide** colio2 21324-40-3, Lithium hexafluorophosphate
RL: DEV (Device component use); USES (Uses)
(method of producing anode for lithium secondary battery)
IT 161286-52-8DP, Lithium sulfide thiosilicate (Li1.2S0.2(SiS3)0.4), solid solution phosphate containing 161286-52-8P, Lithium sulfide thiosilicate (Li1.2S0.2(SiS3)0.4) 364387-50-8P, Lithium silicate sulfide thiosilicate (Li1.34(SiO4)0.05S0.19(SiS3)0.38) 389116-78-3P 389116-81-8P, **Lithium phosphate** sulfide thiosilicate (Li1.29(PO4)0.05S0.19(SiS3)0.38) 389116-85-2DP, solid solution nitride containing 389116-87-4DP, Lithium sulfide thiosilicate (Li1.45S0.3(SiS3)0.34), solid solution phosphate containing 389116-89-6DP, Lithium sulfide thiosilicate (Li1.22S0.2(SiS3)0.4), solid solution phosphate or silicate containing 389116-91-0P, Lithium borate sulfide thiosilicate (Li1.29(BO3)0.05S0.19(SiS3)0.38) 389116-93-2P 389116-95-4DP, Germanium lithium sulfide (Ge0.4Li1.22S1.39), solid solution silicate containing 389116-97-6DP, Gallium lithium sulfide (Ga0.79Li1.22S1.78), solid solution silicate containing 389116-99-8DP, Lithium phosphenotrithioate sulfide (Li1.22(PS3)0.79S0.2), solid solution silicate containing 389117-01-5DP, Lithium sulfide thiosilicate (Li1.12S0.1(SiS3)0.44), solid solution phosphate containing
RL: DEV (Device component use); SPN (Synthetic preparation); **PREP**

(Preparation); USES (Uses)
(method of producing anode for lithium secondary battery)
IT 7439-90-9, Krypton, uses 7440-01-9, Neon, uses 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9, Nitrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method of producing anode for lithium secondary battery)

L39 ANSWER 9 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:317258 HCAPLUS
DN 132:323947
TI Nonaqueous **electrolyte batteries** comprising of cobalt lithium niobium mixed oxide cathode active materials
IN Imachi, Naoki; Kodama, Yasunobu; Yoshida, Ichiro; Nakane, Ikuo; Oikawa, Satoshi
PA Sanyo Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000138075	A2	20000516	JP 1998-311223	19981030
PRAI	JP 1998-311223		19981030		

AB The title batteries contain Li-containing mixed oxides having composition formula LiCo1-xNbxO2 (0.00001 ≤ x ≤ 0.05; preferably 0.001 ≤ x ≤ 0.03), as cathode active materials. The batteries have high working voltage and excellent low-temperature operation characteristics.
IC ICM H01M010-40
ICS C01G051-00; H01M004-48; H01M006-16; H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST nonaq **electrolyte** lithium secondary **battery**; cobalt lithium **niobium oxide** battery cathode
IT Coke
RL: DEV (Device component use); USES (Uses)
(anode active material; cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT Battery cathodes
(cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT Secondary batteries
(lithium; cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(anode active material; cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT 267225-49-0, Cobalt lithium **niobium oxide** (Co0.95-1LiNb0-0.05O2)
RL: DEV (Device component use); USES (Uses)
(cathode active material; cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT 267225-47-8P, Cobalt lithium **niobium oxide** (Co0.99LiNb0.01O2)
RL: DEV (Device component use); PNU (Preparation, unclassified); **PREP (Preparation)**; USES (Uses)
(cathode active material; cobalt lithium niobium mixed oxide cathode active materials in nonaq. **electrolyte batteries**)
IT 554-13-2, Lithium carbonate 1310-65-2, Lithium hydroxide **1313-96-8, Niobium oxide** 7440-03-1, Niobium,

processes 7790-69-4, Lithium nitrate 11104-61-3, Cobalt oxide
12031-63-9, Lithium **niobium oxide** ($LiNbO_3$)
RL: PEP (Physical, engineering or chemical process); **PROC**
(Process)
(cathode active materials from; cobalt lithium niobium mixed oxide
cathode active materials in nonaq. **electrolyte**
batteries)

IT 52627-24-4P, Cobalt **lithium oxide** 267225-50-3P,
Cobalt **niobium oxide**
RL: PEP (Physical, engineering or chemical process); PNU (Preparation,
unclassified); **PREP (Preparation)**; **PROC (Process)**
(cathode active materials from; cobalt lithium niobium mixed oxide
cathode active materials in nonaq. **electrolyte**
batteries)

IT 96-49-1, Ethylene carbonate 132843-44-8
RL: DEV (Device component use); USES (Uses)
(electrolyte; cobalt lithium niobium mixed oxide cathode active
materials in nonaq. **electrolyte batteries**)

IT **1313-96-8, Niobium oxide**
RL: PEP (Physical, engineering or chemical process); **PROC**
(Process)
(cathode active materials from; cobalt lithium niobium mixed oxide
cathode active materials in nonaq. **electrolyte**
batteries)

RN 1313-96-8 HCAPLUS
CN Niobium oxide (Nb_2O_5) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

L39 ANSWER 10 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:28581 HCAPLUS
DN 128:104357
TI Solid state lithium batteries
IN Takada, Kazunori; Fujino, Makoto; Iwamoto, Kazuya; Kondo, Shigeo
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10003943	A2	19980106	JP 1996-154606	19960614
	JP 3297595	B2	20020702		
PRAI	JP 1996-154606		19960614		

AB The batteries have a Li ion conductive solid electrolyte between a pair of
electrodes, where ≥1 of the electrodes is ≤0.2 mm thick, the
electrolyte is ≤0.5 mm thick, and the binder for the electrode or
the electrolyte is a polymer containing SO_3 or SO_3-electron donor adduct
groups added to C:C double bonds in the polymer mol.
IC ICM H01M010-40
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST solid **electrolyte** lithium **battery** polymer binder;
electrode polymer binder lithium battery; sulfur trioxide adduct polymer
lithium battery
IT Battery electrodes
Battery electrolytes
Binders
(polymer binders containing sulfur trioxide groups for electrodes and
electrolytes in solid state lithium **batteries**)

IT Secondary batteries
(polymer binders containing sulfur trioxide groups for solid state lithium batteries)
IT EPDM rubber
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; **PROC (Process)**; USES (Uses)
(reaction products with dioxane-sulfur trioxide adducts; polymer binders containing sulfur trioxide groups for electrodes and **electrolytes** in solid state lithium **batteries**)
IT 9003-55-8DP, Butadiene-styrene copolymer, hydrogenated, reaction products with dioxane-sulfur trioxide adducts 25034-71-3DP, Dicyclopentadiene-ethylene-propylene copolymer, reaction products with dioxane-sulfur trioxide adducts 25038-32-8DP, Isoprene-styrene copolymer, reaction products with dioxane-sulfur trioxide adducts 54287-50-2DP, reaction products with double bond containing polymers 105729-79-1DP, Isoprene-styrene block copolymer, reaction products with dioxane-sulfur trioxide adducts
RL: DEV (Device component use); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; **PROC (Process)**; USES (Uses)
(polymer binders containing sulfur trioxide groups for electrodes and **electrolytes** in solid state lithium **batteries**)
IT 7782-42-5, Graphite, uses 12031-65-1, Lithium nickel oxide (LiNiO2) 12039-13-3, Titanium disulfide 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt **lithium oxide** (CoLiO2) 201471-17-2, **Lithium phosphate** sulfide thiosilicate (Li1.29(PO4)0.01S0.27(SiS3)0.36) 201471-18-3, **Lithium oxide** sulfide thiosilicate (Li1.24O0.05S0.19(SiS3)0.38)
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); **PROC (Process)**; USES (Uses)
(polymer binders containing sulfur trioxide groups for electrodes and **electrolytes** in solid state lithium **batteries**)

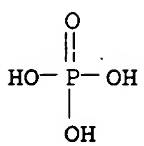
L39 ANSWER 11 OF 13 HCAPLUS
AN 1998:25647 HCAPLUS
DN 128:148441
TI Lithium-ion-conductive solid electrolyte
IN Takada, Kazunori; Iwamoto, Kazuya; Kondo, Shigeo; Takeuchi, Yasumasa; Masaka, Fusazumi; Ishikawa, Katsuhiro
PA Matsushita Electric Industrial Co., Ltd., Japan; Japan Synthetic Rubber Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10003818	A2	19980106	JP 1996-154625	19960614
	JP 3533289	B2	20040531		
PRAI	JP 1996-154625		19960614		

AB The electrolyte contains a Li-ion-conductive inorg. solid electrolyte and a polymer manufactured by treating its C:C double bonds with SO3 or a SO3-electron-donating compound complex. The electrolyte shows high-ion conductivity and flexibility. The **electrolyte** is useful for a **battery** in a personal computer, a personal handy phone, etc.
IC ICM H01B001-06
ICS H01M006-18; H01M010-40; C08F008-36
CC 76-2 (Electric Phenomena)

Section cross-reference(s): 38, 39, 52, 57
ST lithium ion conductive solid electrolytic capacitor; polymer sulfonylation sulfur trioxide complex; **battery** lithium ionic conductor **electrolyte**; rubber inorg electrolyte lithium ion conductor
IT Ionic conductors
(Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT Isoprene-styrene rubber
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(block, sulfonylate; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT EPDM rubber
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(dicyclopentadiene-ethylene-propene, sulfonylate; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT Sulfide glasses
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(lithium, silicon; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT Isoprene-styrene rubber
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(sulfonylate; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 120479-61-0P, Aluminum lithium titanium phosphate (Al0.3Li1.3Ti1.7(PO4)3)
RL: DEV (Device component use); IMF (Industrial manufacture); **PREP (Preparation)**; USES (Uses)
(Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 554-13-2, Lithium carbonate 1344-28-1, Alumina, processes 10377-51-2, Lithium iodide (LiI) **10377-52-3, Lithium phosphate (Li3PO4)** 12007-33-9, Boron sulfide (B2S3) **12057-24-8, Lithium oxide (Li2O)**, processes 12136-58-2, Lithium sulfide (Li2S) 13463-67-7, Titania, processes 13759-10-9, Silicon disulfide 14265-44-2, Orthophosphate, processes
RL: PEP (Physical, engineering or chemical process); **PROC (Process)**
(Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 105729-79-1
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(isoprene-styrene rubber, block, sulfonylate; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 25038-32-8
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)
(isoprene-styrene rubber, sulfonylate; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 25034-71-3DP, Dicyclopentadiene-ethylene-propylene copolymer, sulfonylated 25038-32-8DP, Isoprene-styrene copolymer, sulfonylated 105729-79-1DP, Isoprene-styrene block copolymer, sulfonylated
RL: DEV (Device component use); IMF (Industrial manufacture); **PREP (Preparation)**; USES (Uses)
(rubber; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT 7446-11-9, Sulfuric anhydride, uses 35346-47-5, Sulfur trioxide dioxane complex
RL: MOA (Modifier or additive use); USES (Uses)

(sulfonylation agent; Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
IT **10377-52-3, Lithium phosphate (Li_3PO_4) 12057-24-8, Lithium oxide (Li_2O)**, processes
RL: PEP (Physical, engineering or chemical process); **PROC (Process)**
(Li-ion-conductor containing sulfonylated polymer and inorg. electrolyte)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



● 3 Li

RN 12057-24-8 HCAPLUS
CN Lithium oxide (Li_2O) (8CI, 9CI) (CA INDEX NAME)

Li— O— Li

L39 ANSWER 12 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:617782 HCAPLUS
DN 127:296234
TI Lithium ion conductive solid electrolytes and solid state secondary lithium batteries
IN Iwamoto, Kazuya; Fujino, Makoto; Takada, Kazunori; Kondo, Shigeo
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09245828	A2	19970919	JP 1996-55731	19960313
	JP 3528402	B2	20040517		
PRAI	JP 1996-55731		19960313		

AB The electrolytes are X-Li_2S-SiS_2 (X = **Li_2O, Li_3PO_4**, Li_2SO_4, Li_2CO_3, and/or Li_3BO_3) obtained by using directly synthesized Li_2S and/or directly synthesized SiS_2 as raw material. The Li_2S is obtained by reacting Li and S at ≤186° in vacuum or in an inert gas, SiS_2 is obtained by reacting S and Si at 500-1300° in vacuum or in an inert gas, and the Li_2S and SiS_2 are reacted with the other components at 445-975° to obtain the electrolyte.
IC ICM H01M010-36
ICS C01D015-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery electrolyte** lithium silicon sulfide manuf
IT **Battery electrolytes**

(direct synthesis of lithium sulfide and silicon sulfide from elements for solid **electrolyte** manufacture of secondary lithium **batteries**)

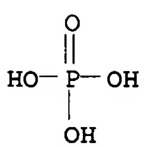
IT 12136-58-2P, Lithium sulfide 13759-10-9P, Silicon disulfide
RL: DEV (Device component use); IMF (Industrial manufacture); **PREP (Preparation)**; USES (Uses)
(direct synthesis of lithium sulfide and silicon sulfide from elements for solid **electrolyte** manufacture of secondary lithium **batteries**)

IT 196418-93-6P, **Lithium phosphate** silicide sulfide
RL: DEV (Device component use); IMF (Industrial manufacture); **PREP (Preparation)**; USES (Uses)
(manufacture of lithium sulfide-silicon sulfide-**lithium phosphate** solid **electrolyte** for secondary lithium **batteries**)

IT **10377-52-3, Lithium phosphate**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); **PROC (Process)**; USES (Uses)
(manufacture of lithium sulfide-silicon sulfide-**lithium phosphate** solid **electrolyte** for secondary lithium **batteries**)

IT **10377-52-3, Lithium phosphate**
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); **PROC (Process)**; USES (Uses)
(manufacture of lithium sulfide-silicon sulfide-**lithium phosphate** solid **electrolyte** for secondary lithium **batteries**)

RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)

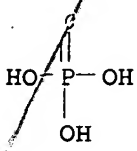


●3 Li

L39 ANSWER 13 OF 13 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1996:569403 HCAPLUS
DN 125:200870
TI Secondary solid lithium **batteries** with improved **electrolytes**
IN Iwamoto, Kazuya; Aotani, Noboru; Takada, Kazunori; Kondo, Shigeo
PA Matsushita Electric Ind Co Ltd, Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08195219	A2	19960730	JP 1995-221366	19950830
PRAI	JP 1995-221366	A	19950830		
	JP 1994-279174		19941114		

AB The batteries use anodes and/or cathodes from 3.0:7.0-9.5:0.5 (weight ratio) mixts. of the active mass having average diameter 0.1-50 μm and solid electrolytes having average diameter 0.1-50 μm, preferably which are Li ion-conducting amorphous sulfide-based electrolytes. Alternatively, the batteries use anodes and/or cathodes containing (1) Li ion-conducting amorphous sulfide-based solid electrolytes, and (2) Co Li oxides having average diameter 5-50 μm, preferably which are manufactured from Co oxide (preferably Co3O4) and Li compds. at a mixing ratio of Co/Li <1.0. The anodes and/or cathodes may contain the Co Li oxides and the electrolytes at a weight ratio of oxide:electrolyte 4.0:6.0-9.5:0.5.
IC ICM H01M010-36
ICS H01M004-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **battery electrolyte** sulfide glass; cobalt **lithium oxide** battery cathode
IT **Battery electrolytes**
(**battery electrolytes** from size-controlled sulfide-based glass contained in anodes or cathodes)
IT Glass, nonoxide
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(sulfide, **battery electrolytes** from size-controlled sulfide-based glass contained in anodes or cathodes)
IT 554-13-2, Lithium carbonate 1308-06-1, Cobalt oxide (Co3O4)
RL: PEP (Physical, engineering or chemical process); **PROC (Process)**
(anodes from; **battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
IT 12136-58-2, Lithium sulfide 13759-10-9, Silicon sulfide (SiS2) 140435-84-3, Phosphorus sulfide (P2S5)
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(**battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
IT 7782-42-5, Graphite, uses 12031-65-1, Lithium nickel oxide (LiNiO2) 12039-13-3, Titanium disulfide
RL: DEV (Device component use); USES (Uses)
(cathodes; **battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
IT 12190-79-3P, Cobalt **lithium oxide** (CoLiO2)
RL: DEV (Device component use); PNU (Preparation, unclassified); **PREP (Preparation)**; USES (Uses)
(cathodes; **battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
IT **10377-52-3, Lithium phosphate** **12057-24-8, Lithium oxide**, uses 178958-56-0, Lithium silicon oxide
RL: MOA (Modifier or additive use); USES (Uses)
(glass component; **battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
IT **10377-52-3, Lithium phosphate** **12057-24-8, Lithium oxide**, uses
RL: MOA (Modifier or additive use); USES (Uses)
(glass component; **battery electrolytes** from sized-controlled sulfide-based glass contained in anodes or cathodes)
RN 10377-52-3 HCAPLUS
CN Phosphoric acid, trilithium salt (8CI, 9CI) (CA INDEX NAME)



●3 Li

RN   12057-24-8   HCAPLUS
CN   Lithium oxide (Li_2O) (8CI, 9CI)   (CA INDEX NAME)

Li—O—Li

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